

Giftedness and Talent in the 21st Century

Adapting to the Turbulence of Globalization

Don Ambrose and
Robert J. Sternberg (Eds.)

Foreword by Joseph S. Renzulli



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Giftedness and Talent in the 21st Century

ADVANCES IN CREATIVITY AND GIFTEDNESS

Volume 10

Advances in Creativity and Gifted Education (ADVA) is the first internationally established book series that focuses exclusively on the constructs of creativity and giftedness as pertaining to the psychology, philosophy, pedagogy and ecology of talent development across the milieus of family, school, institutions and society. ADVA strives to synthesize both domain specific and domain general efforts at developing creativity, giftedness and talent. The books in the series are international in scope and include the efforts of researchers, clinicians and practitioners across the globe.

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Foreword by Joseph S. Renzulli

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JOSEPH S. RENZULLI

FOREWORD

Stream of Consciousness on Creativity, Globalization, Technology, and What Is Happening in a Rapidly Changing World

Nothing endures but change.

(Heraclitus)

There I sat. Thirty thousand feet above the North Pole looking at the New York Times, watching the moving map on my personal TV screen, checking my email, and munching on a meal that was actually cooked on the plane. Fourteen hours to Hong Kong just crawled across the bottom of my TV. I wondered how long it took Marco Polo to get to China and what Wilber and Orville would have thought about flying from JFK to Hong Kong in 14 hours, inflight TV and Internet, and the meals cooked and served on planes. Their first flight was 59 seconds, went up about 14 feet, and covered 40 yards. I'm glad Orville lived long enough to see big four engine planes fly across the Atlantic.

We're flying the same route flown by Korean Airlines 007 when a Russian missile shot it down in 1983 – Missiles! Creativity? Technology? Thank goodness the Cold War is over but an article in today's Times described some bad news – an alleged H-Bomb and missile test by the North Koreans. More creativity and technology gone astray! I hope my plane is well outside their air space. I wonder what the emperors who built the Great Wall would have thought about their defensive technology.

But another article in today's Times reported some good news – the FDA just approved a new drug developed by a Chinese/American team of researchers for the treatment of melanoma. Good news for me since my annual PET scan is coming up. Nice example of the best use of creativity and international cooperation. Will technology improve what happens on this ever-shrinking globe or help us destroy it? Almost a third of the Earth's population is in China. Imagine if the creative potential of this massive country could be unleashed. Maybe they would figure out the definitive cure for melanoma and all other cancers. One thing is for certain – creativity and innovation and technology and globalization touch everyone's lives every day. Small world! Back to work. I need to finish the chapters that Don and Bob sent me so I can write a preface for their books.

Educational policy makers in China have finally come to the realization that their relentless pressure to produce the highest test scores in the world needs to be balanced with curricular and instructional strategies that promote creativity. One high ranking

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official said to me, “We can make anything you Americans invent faster, cheaper, and in many cases better, but we want more inventors and innovators and Nobel Prize winners.” I wondered if those fancy UCONN pens I brought as gifts for my hosts were made in China! The persons who invited me said they wanted to “pick my brain” on better ways of promoting and infusing more teaching for creativity and innovation into the Chinese education system. I sometimes wonder if the more I learn about topics like creativity, globalization, and technology the less certain I am about what can be done to infuse good practices into what happens on a day-to-day basis in classrooms around the world. Glad I’m reviewing chapters that take on the interrelationships between and among these multifarious concepts – some ideas are starting to come together.

These random thoughts plowed through my brain as I turned off my in-flight TV and started to read another chapter from the books that Don and Bob asked me to review. This pioneering two-book series wraps its arms around all of the big ideas and issues that define the study of creativity, globalization, and a modern world that is changing at warp speed. As most of the chapter authors in the book point out, creativity, globalization, and technology have brought into perspective the numerous political, social, economic, and human relations issues that define the 21st Century. And undoubtedly, what was most important to me is that educators at all levels, from policy makers, researchers, and school administrators to curriculum developers, counselors, psychologists, and classroom teachers, will find ideas and issues in these books that pertain to the research, theory, and practice that guide educators in making schools more effective places for young people.

The editors of this series have brought together a diverse group of the most prominent contributors to the literature in creativity, giftedness, curriculum development, the arts, talent development, and literacy. The books integrate the complex and diverse elements of these topics with the overriding themes of creativity and globalization. The sheer scope and detail of information about issues in each author’s respective area of specialization is almost overwhelming and it made me both think about my own work and things that need to be reexamined in view of the “macroproblems” that we face in a rapidly changing world and the need for interdisciplinary work in fields that have for too long have been studied in isolation. It certainly made the many disparate ideas in my brain, ideas that have appeared, disappeared, and reappeared in the literature over the decades, crash through my mind and I wondered what would be the best things to say in this preface.

No one sits down and reads books like this from cover to cover, but there is something in these two volumes for everyone. I suggest that readers begin with the introductory chapters of both books. These “big picture” focus chapters synthesize insights from over thirty academic disciplines. The overviews will help you understand the impact of globalization on the life prospects of today’s young people and will also help you make decisions about which chapters are most relevant to your own work. The interdisciplinary nature of macroproblems such as climate change, economic inequality, and political turmoil set the stage for addressing

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macro-opportunities, which are unprecedented circumstances that can lead to significant advances in well-being for billions of people around the world. A focus chapter includes a 3-D model portraying globalization as an enormous wave with macro-opportunities on top and macroproblems on the underside of the wave. If we develop the knowledge, skills, and dispositions required for dealing with the complexities of 21st-century trends and issues, we may be able to leap to the crest of the wave and capitalize on the macro-opportunities. If not, we may be crushed underneath the wave by a combination of macroproblems. A part of the analysis highlights arguments about societal collapse generated by scholars in 15 different disciplines. Each of these prominent scholars argue that current conditions could lead to the collapse of societal institutions some time in the 21st century.

The stream of consciousness prompted by reviewing chapters in these two volumes made me realize that today's world is a much different place than it was when most of the theories that guide today's education system were developed. The only thing that has remained constant is change, and the focus of these two unique volumes will help you, as it has helped me, see that to move forward with new ideas we must consider change within the larger context of creativity, globalization, technology, and the interdisciplinary nature of knowledge. The stream of consciousness also reminded me that creativity, globalization, technology, and what takes place in the larger world affects every one of us every day and that is a good thing. We all live on the same planet and we all have a responsibility to contribute our gifts and talents to making this small planet a better place.

Joseph S. Renzulli
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SECTION I

RECOGNIZING POWERFUL CONTEXTUAL INFLUENCES ON GIFTEDNESS AND TALENT DEVELOPMENT

DON AMBROSE AND ROBERT J. STERNBERG

1. PREVIEWING A COLLABORATIVE EXPLORATION OF GIFTED EDUCATION AND TALENT DEVELOPMENT IN THE 21ST CENTURY

Are gifted and talented young people ready to handle complex 21st-century socioeconomic, political, cultural, and technological conditions when they move into adulthood? Will complex 21st-century societies benefit sufficiently from the actions of the gifted and talented to survive and thrive in the rapidly evolving context of 21st-century globalization? While most of the research, practice, and theory development in gifted education focuses on the effectiveness of current practices and pays little attention to large-scale global issues there are some exceptions. For example, Joe Renzulli (2012) analyzed the goals of gifted education and talent development in today's world, highlighting the need for more insightful theory development in the field so we can more effectively enable bright young people to discover worthy aspirations while preparing for leadership roles in the complex 21st-century. He magnified the importance of helping the gifted and talented develop and employ executive functions that will enable them to become effective planners, decision makers, and ethical leaders in novel, complex situations. This advice is on the mark considering the growing complexity of 21st-century globalization.¹

Another panoramic thinker in our field, Roland Persson (2012), showed us some ways in which gifted education is at least somewhat confined by dogmatic cultural insularity and excessive influence from the globalized socioeconomic system. The result is some insensitivity to cultural variation in conceptions of giftedness and talent development just when stronger awareness of diversity would help educators of the gifted prepare their high-potential students for interactions with diverse peers in an increasingly integrated international environment. Sternberg's (2005, 2009, 2013) conceptions of leadership also broaden our vision by emphasizing the need for a synthesis of wisdom, intelligence, and creativity so gifted leaders can promote ethical outcomes in complex conditions. One more promising sign that our field is capable of elevating its collective gaze out toward the global socioeconomic and cultural contexts that so strongly influence our work is the activity within the global awareness network of the National Association for Gifted Children as well as occasional publications aligned with that awareness (e.g., Gibson, Rimmington, & Landwehr-Brown, 2008; Roeper, 2008; Sisk, 2013; von Károlyi, 2008).

Based on interdisciplinary explorations and collaborations that kept turning up huge socioeconomic and cultural problems and opportunities and their connections

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with creativity, giftedness, and talent development (see Ambrose, 2009; Ambrose & Cross, 2009; Ambrose & Sternberg, 2012; Ambrose, Sternberg, & Sriraman, 2012; K. Sternberg & R. Sternberg, 2012; Sternberg, 2014; Sternberg & Jordan, 2005; R. Sternberg & K. Sternberg, 2008), we decided it would be wise to explore the ways in which giftedness, talent development, and creativity might be interacting with 21st-century globalization, which is the biggest contextual influence of our time. Consequently, we designed this project involving far-reaching, interdisciplinary analyses of globalization and the high-impact trends and issues it is generating. We invited leading thinkers from the fields of creative studies, gifted education, and general education to respond to an interdisciplinary focus chapter on globalization (the next chapter in this volume) from their areas of expertise. Those analyzing globalization through the lenses of gifted education and talent development joined us in the formation of this book. Those doing a similar analysis through the lenses of creativity research and theory clustered together as contributing authors for a sister book on creativity (Ambrose & Sternberg, 2016). Taken together, these two projects align with recommendations from leading scholars of creativity and giftedness who envision the need for the development of stronger creative capacities, wisdom, and ethics so bright young people will be better able to grapple with the complex challenges of the 21st century (see Gardner, 2012; Gardner, Csikszentmihalyi, & Damon, 2001; Reis & Renzulli, 2010; Renzulli, 2012; Sternberg, 2013, 2014).

The following questions preview more in-depth analyses that you will find in the chapters to come. If a question piques your interest, we recommend that you go directly to the relevant chapter for more in-depth exploration.

Questions Based on Interdisciplinary Analyses of 21st-Century Globalization

These questions emerge from the next chapter in this volume, which is the interdisciplinary focus chapter contributing authors used as a basis for their analyses from their areas of expertise:

- Are gifted education programs designed to enable bright young people to grasp the complexities of 21st-century problems that transcend international borders as well as the borders between academic disciplines?
- Can gifted education programs help bright young people think long term so they can appreciate the nature of problems that emerge and evolve over decades or even centuries?
- To what extent are gifted young people ready to understand and capitalize on unprecedented opportunities emerging from rapidly evolving developments in technology and scientific innovation?
- Can the gifted and talented develop the ethical awareness they will need to grapple with the severe socioeconomic inequality that 21st-century globalization is generating?

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- How many of today's economic and political leaders went through gifted programs when they were children? How many of these gifted individuals grew up to become clever innovators with stunted ethics?
- If a large "creative intelligence gap" separates our current level of cognitive ability from the much higher level we will need for solving today's huge problems, can gifted education programs enable us to close that gap?
- Will gifted young people be able to navigate through the exponential knowledge growth produced by 21st-century information technology and scientific networking?
- Are the gifted and talented more or less likely to be immune to the dogmatism that makes ethnic, religious, and national groups engage in conflict with one another?
- Does gifted education make it more likely that bright young people will be able to work together in the diverse teams that tend to outperform homogenous teams when it comes to grappling with highly complex problems?
- If gifted education emphasizes the development of the gifted *individual*, does that emphasis work against the future emergence of the teamwork necessary for the scientific networking that promises to help us solve some of the biggest problems of the 21st century?
- Can gifted education help the leaders and entrepreneurs of tomorrow escape their own selfish inclinations so they won't aggravate the growing problem of severe inequality in an increasingly deregulated, globalized socioeconomic system?
- If democracies in the 21st century are fragile and prone to degeneration into plutocracies (rule by and for the extremely rich), do gifted education programs provide sufficient sociopolitical awareness to serve as an antidote to the erosion and collapse of democracy?
- Are gifted adults aware of environmental and socioeconomic trends that are strengthening the possibility that we will suffer from a major collapse of civilization some time in the 21st century? If they are aware of the possibility of such a collapse, to what extent do they care about it?²
- Are some gifted, powerful adults initiating and promoting narrowly conceived, dogmatic school reform initiatives that are driving American education back to the 19th century while some other nations are striving to move their education systems from 20th century models into the 21st century?
- Are today's citizens, policymakers, and academic researchers aware that some powerful school reform initiatives are pressuring American education to evolve into a system of educational apartheid that provides privileged young people with outstanding learning and networking opportunities while pushing the vast majority of those less fortunate into intellectually barren, quasi-militaristic, under-resourced schools?
- How many of us are aware that China and the USA are involved in an ironic circular chase because they are trying to copy and catch up with each other in the design of their 21st century educational systems?

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- Do gifted programs provide sufficient opportunity for the development of the interdisciplinary thinking necessary for understanding the important 21st-century issues that extend beyond the borders of single academic disciplines and professional fields?
- Will graduates of our gifted programs have the wisdom to support, oppose, or shape the development of new technologies in the 21st century based on critical thinking about the likely implications of those technological advances?
- Do our gifted programs help students develop the entrepreneurial savvy and resilience necessary for adaptation in conditions of growing insecurity and unpredictability?
- How can gifted young people discover and develop strong aspirations and talents in turbulent, unpredictable 21st-century work environments?
- How can the gifted and talented discover and develop leadership potential in an integrated, globalized world that brings together very diverse individuals and groups?

Questions Derived from the Work of Our Contributing Authors

These questions arise from the remaining chapters in the volume. The names of the authors whose work is relevant to each question are written in parentheses.

- How clear and useful is the distinction between the “gifted” and the “non-gifted” in view of the talents needed for success in the 21st century? Does the talent-development paradigm provide useful guidance for educators of the gifted in today’s world? (David Yun Dai, Chapter 3)
- How much control do gifted individuals actually have in their navigation through the turbulence and complexity of 21st-century events and circumstances? (Roland Persson, Chapter 4)
- What dispositions and psychosocial skills can help the gifted young person become eminent in a specific domain in today’s conditions? (Paula Olszewski-Kubilius, Rena Subotnik and Frank Worrell, Chapter 5)
- Can we extend beyond the cognitive domain to develop the whole person, which includes the social, affective, emotional, spiritual, and ethical dimensions of experience? How will this holistic emphasis on child and adolescent development align with the demands of the 21st century? (Kirsi Tirri, Chapter 6)
- Can gifted education recognize and address the huge problem of conflicting core values in 21st-century societies? (Jennifer Cross and Tracy Cross, Chapter 7)
- Can comparing and contrasting the differing constraints confronted by education in very different nations with differing ideologies help us gain insights about the optimal education of the gifted and talented in the 21st century? (Bharath Sriraman and Kyeonghwa Lee, Chapter 8)
- Is it possible for severely deprived, culturally diverse, gifted young people in Latin America to benefit from the same opportunities enjoyed by the gifted

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and talented in Europe and North America when it comes to the discovery and development of aspirations and talents? (Sheyla Blumen, Chapter 9)

- Can the organizations of the 21st century dismantle stereotypes that suppress the development of creative intelligence and undermine efforts to engage in productive innovation? (Mary Jacobsen, Chapter 10)
- Can we help gifted young people discover stronger senses of empowerment, ethics, and connection with others that will help them overcome the excessive materialism and individualism of today's Western culture? (Dorothy Sisk, Chapter 11)
- Will gifted education be able to develop autonomous learners, complex thinkers, and problem solvers who can integrate their cognitive, social, emotional, and physical capacities in complex 21st century conditions? (George Betts, Blanche Kapushion, and Robin Carey, Chapter 12)
- To what extent can gifted learners develop higher-level thinking skills and inclinations for integrating learning from differing subject areas in order to address today's real-world problems? (Joyce VanTassel-Baska, Chapter 13)
- Are educators of the gifted able to identify the different types of learners and adjust their talent development to minimize the gap between their potential and actual performance so they have the best opportunities for success in the complexity of the 21st century? (Seon-Young Lee, Chapter 14)
- Are we able to help twice-exceptional individuals address their weaknesses while recognizing and emphasizing their strengths so they can meet the demands of 21st-century globalization? (Rick Olenchak, Laura Jacobs, Maryam Hussain, Kelly Lee, and John Gaa, Chapter 15)

Only a few of many possible questions are listed here, just enough to give you a sense of the intellectual terrain our contributors chose to explore in efforts to integrate giftedness and talent development with 21st-century globalization. We leave it to you to raise more questions as you make your way through the pages to come. Our hope is that this book will prompt readers to pay more attention to the effects of large-scale contextual influences on their own work.

AN OVERVIEW OF THE CONTENTS OF THE VOLUME

This book includes four sections that connect much of what we know about giftedness and talent development with the challenges of 21st-century globalization. The first section introduces the project and provides an interdisciplinary framework for analyses of globalization. The second section addresses conceptions of giftedness and talent development within the context of globalization. Authors in the third section come up with ways to make gifted education align better with 21st-century contextual influences. Finally, section four represents the synthesis of the contributions in the volume.

Our introductory section titled *Recognizing Powerful Contextual Influences on Giftedness and Talent Development*, is comprised of this introductory chapter

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and a focus chapter titled, *Twenty-First Century Contextual Influences on the Life Trajectories of the Gifted and Talented*. In the focus chapter, Don Ambrose provides a conceptual model based on the integration of perspectives from multiple disciplines. The model illustrates the threat of enormous macroproblems and the potential benefits of unprecedented macro-opportunities that arise from socioeconomic, technological, cultural, and political-ideological conditions in the 21st century. The macroproblems threaten to crush individuals and societies that find themselves mired in a miserable trap underneath an enormous wave of globalization. Fortunately, the macro-opportunities promise to lift individuals and societies toward unprecedented success, if the education system can enable today's young people to leap to the crest of the globalization wave. After the analysis of 21st-century demands, suggestions are made about the blend of knowledge, skills, and dispositions required for dealing with the macroproblems and capitalizing on the macro-opportunities. This focus chapter serves as a launching pad for the other contributing authors' analyses. They use it to examine ways in which their expertise fits together with trends and issues in the 21st century.

David Yun Dai initiates section two with his chapter titled, *Envisioning a New Century of Gifted Education: The Case for a Paradigm Shift*. In his analysis, David continues his ongoing scrutiny of the gifted-child paradigm, this time in the context of 21st-century conditions. He considers the nature and shortcomings of current conceptions of giftedness as well as some other challenges to the effectiveness of work in the field. He sets the stage by taking an excursion through the research on creativity and giftedness, paying special attention to the work of pioneers such as Paul Torrance and Joseph Renzulli. He also analyzes the strengths and weaknesses of competing paradigms in gifted education, emphasizing the limitations of the essentialist conception³ and the possible fit of the talent development framework with the 21st-century socioeconomic and cultural context.

Roland Persson exercises his penchant for big-picture thinking in his chapter, *Human Nature: The Unpredictable Variable in Engineering the Future*. He temporarily backs away from the specifics of giftedness, talent development, and creativity to explore the bigger issue of human nature itself. Part of the analysis brings forth the somewhat troubling possibility that not even the gifted and talented have as much control over life's events as they think they do, and that they might have even more difficulty than most because they are often marginalized due to their differences from the mainstream. He suggests that we must come to terms with these limitations in order to be more effective in exerting our shaping influences over the powerful trends and issues of the 21st century. Social cohesion and ethical awareness must come into play if we are to nudge globalization in positive directions.

Paula Olszewski-Kubilius, Rena Subotnik, and Frank Worrell draw some intriguing connections between their influential mega-model for talent development and 21st-century conditions in their chapter titled, *The Role of Domains in the Conceptualization of Talent*. The complexity of 21st-century globalization exerts strong influences on talent development, which was complex enough even in far

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less turbulent 20th-century socio-contextual environments. The talent development mega-model portrays optimal growth of high ability as a sequence of successful transitions from strong potential to competency within a domain to expertise within that domain and finally to eminence for those most able to blend their outstanding capacities with educational and career opportunities. While revealing the dynamics of these successful developmental transitions, the authors discuss some ways in which existing domains are changing and new domains might be emerging through the influence of globalization. The take-home message is that support for the development of knowledge, interests, and especially psychosocial strengths must be informed by knowledge of the talent development demands embedded in the various domains.

Kirsi Tirri provides an international, multidimensional analysis in her chapter titled, *Holistic Perspectives on Gifted Education for the 21st Century*. She shows how many European nations interpret the purpose of education as encompassing much more than the cognitive domain, which dominates American education. This broader view of education includes the development of the whole person, which in turn embraces the social and affective aspects of experience as well as emotional and spiritual concerns. While there is much less emphasis on identification and programming for the gifted there is room for their appropriate development due to the more expansive vision of education in Finland. Some particular aspects of this expansive vision include attention to distinct, multiple intelligences, ethical sensitivity, moral judgment, values and worldviews, altruism, respect for diversity, and discovery of a sense of purpose. The end result is a more global vision of gifted and general education for a globalized world.

Jennifer Cross and Tracy Cross situate gifted education within one of the most pressing problems in today's world. In their chapter titled, *The Macroproblem of Conflicting Values in 21st-Century Education*, they show how an important characteristic of 21st-century globalization is the way in which it ties together diverse populations through intricate socioeconomic networks. This networking has significant advantages but it also brings forth some enormous problems. When populations have differing, conflicting values they are likely to have great difficulty when it comes to finding common ground. Misunderstandings and conflicts will ensue. Fortunately, Jennifer and Tracy tackle this issue head on. After providing an in-depth overview of the scholarship on values, they identify the ways in which divergent values can subvert attempts to generate an educational system that can address the challenges of the 21st century. Their ambitious attempt to analyze the barriers imposed by values conflicts shows up in a framework connecting various value systems to the knowledge, skills, and dispositions that are required for success in the context of 21st-century globalization.

Bharath Sriraman and Kyeonghwa Lee consider the effects of globalization on two Asian nations in their chapter titled, *The Hobbesian Trap in Contemporary India and South Korea: Implications for Education in the 21st Century*. Their analysis portrays some ways in which globalization exerts differing impacts on

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these nations, which represent very different settings for the nurturance of gifts and talents. While the economies of both nations have grown considerably, young people still face some unusual constraints when it comes to the discovery of aspirations and the development of their talents. The authors invoke constructs such as ideological frameworks and social Darwinian processes to clarify the nature of these contextual influences. They conclude with some comments about what each nation must do to strengthen the chances for the success of their next generations as they confront the turbulence of 21st-century globalization.

Sheyla Blumen takes us into Latin American contexts in her chapter titled, *High Achieving Deprived Young People Facing the Challenges of the 21st Century*. She describes some daunting challenges faced by gifted education in Latin America and the Caribbean region while emphasizing some advocacy efforts on behalf of indigenous populations suffering from socioeconomic deprivation. She zeroes in on Peru, which provides examples of some promising attempts at providing impoverished, culturally diverse young people with opportunities to discover and develop their potential in spite of the odds against them. Her analysis includes interpretations of ways in which 21st-century conditions are influencing the life chances of bright young people in this part of the world.

Mary Jacobsen gives us a look at organizational development, leadership, and innovative processes in her chapter titled, *Clearing the Way for Pivotal 21st-Century Innovation: More Talent Literacy, Less Talent Management*. She turns our attention toward the need for innovation in our organizations in view of the complex, new demands on organizational systems posed by developments in the 21st century. Mary argues that those who work in organizations, especially those who take on leadership roles, must break themselves free from counterproductive stereotypes that suppress the work of talented innovators. These stereotypes often involve colleagues' negative perceptions of talented employees. She uses the term "talent literacy" to help us understand the need for clarifying the nature of our misconceptions and dogmatism when it comes to appreciating and facilitating the work of those most capable of lifting organizations out of various forms of entrenchment and moving those organizations toward the acquisition of innovative new capacities that will enable them to succeed in complex, 21st-century conditions. While emphasizing the importance of innovators, she frequently returns to discussions of changing societal conditions and the ways in which these conditions are making the work of talented innovators more important than ever before. Particularly useful is an ICD (intensity, complexity, drive) model she develops to enable better understanding of the productive attributes and contributions highly talented individuals can bring to organizations, and to the world.

Dorothy Sisk closes this section by investigating some problems faced by many in today's globalized world. In her chapter, *Filling that Empty Space in the Lives of People in a Globalized World Beset with Turbulence and Crises*, she discusses the sense of angst that can arise when our values are driven by excessive individualism and materialism, as they are in much of the world today. Arguing that the gifted

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and talented suffer more than most from these problems she advocates for the development of spiritual intelligence that brings into play intuitive processes, visualization, and other practices that typically aren't addressed by formal education. She illustrates her arguments with discussions of exemplars of spiritual intelligence and recommends some ways to turn education in a direction favorable to the advancement of these broader capacities.

The third section of the book is titled *New Practicalities of Gifted Education in the 21st Century*. Here the authors explore a variety of practical modifications of gifted education that can better align programs, curriculum, and instruction with the demands of globalization.

George Betts, Blanche Karpushian, and Robin Carey recognized the topic of 21st-century globalization as a good fit with an influential conceptual framework in the field. They articulate and employ this framework in their chapter titled, *The Autonomous Learner Model: Supporting the Development of Problem Finders, Creative Problem Solvers, and Producers of Knowledge to Successfully Navigate the 21st Century*. The well-known autonomous learner model integrates a wide array of abilities and processes that, taken together, can strengthen the aspirations, talents, and life prospects of young people. The unprecedented nature of today's large-scale problems and opportunities require considerable amounts of higher-order thinking as well as visionary aspiration development and the nurturing of initiative over the long term. Fortunately, the autonomous learner model, which has been undergoing revisions throughout the years, is designed to develop these capacities.

Joyce VanTassel-Baska contemplates some modifications to gifted education in her chapter *Creativity and Innovation: The Twin Pillars of Accomplishment in the 21st Century*. While outlining some big-picture patterns in the structure and dynamics of gifted education over the years, Joyce argues that current emphases on the development of creativity should be augmented with more attention to the development of propensities for innovative work. Through detailed analyses she distinguishes between these emphases and then shows how strengthening the innovative inclinations and abilities of gifted young people will align them and society more accurately with the demands of the 21st century. In essence, she recommends an injection of pragmatism into gifted education and into the subsequent adult lives of the gifted. The development of STEM innovative ability receives particular attention.

In her chapter titled, *Navigating Talent Development by Fulfilling Gaps between Gifted Potential and Performance*, Seon-Young Lee analyzes some important aspects of gifted underachievement while thinking about ways in which the problem of underachievement is magnified in 21st-century conditions. While underachievement always has been a problem it is even more pernicious for individuals and societies that must navigate through the big problems and opportunities presented by 21st-century globalization. While investigating underachievement, Seon-Young analyzes an array of categories into which gifted underachievers can fit. These categories have to do with cognitive style, academic motivation, sensitivity,

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behavioral issues, and interpersonal relationships. She identifies 13 different types of gifted underachievers and recommends strategies that can address the strengths and weaknesses of each.

Richard Olenchak, Laura Jacobs, Maryam Hussain, Kelly Lee, and John Gaa take us beyond the cognitive realm to focus on affective development in today's turbulent, socioeconomic context. In their chapter, *Giftedness Plus Talent Plus Disabilities: Twice-Exceptional Persons, the 21st Century, and Lifespan Development as Viewed through an Affective Lens*, the authors also consider the increasingly prominent phenomenon of dual exceptionality, which has some interesting potential connections with 21st-century conditions. This is especially the case when the authors look at the lifespan development of twice-exceptional individuals and their life prospects as adults. They set up their analysis by providing an overview of the intricate interplay between nature and nurture in the development of affect. They cover a considerable amount of intellectual territory in the analysis, including neuroscientific findings about affective and cognitive development.

Finally in section 5 Robert Sternberg integrates the complex, diverse elements of giftedness, talent development, and globalization in his chapter titled *Has the Term "Gifted" Become Giftig (Poisonous) to the Nurturance of Gifted Potential?* "Giftig" is the German word for "toxic." And the use of the term has become, in some instances, toxic. As used, it can hold back education. At one time, educators thought they had a clear sense of what "giftedness" is: It was high IQ. That's how Lewis Terman and his colleagues operationalized the term back in the early part of the 20th century. Now, a century later, many educators are still using the term in more or less the same way. But does high IQ, or even high school grades, represent the future of what we need to nurture gifted potential in the 21st century? By using this term, are we dogmatically locking ourselves into the distant past rather than opening up a new future? Sternberg argues in his final chapter that the term in its traditional usage so longer fits the needs of our world. In more modern senses, the term has come to mean so many things to so many different people that it no longer is serving the constructive function it once may have served. It may even be encouraging the identification of children other than those best equipped to deal with the problems of the future. It is time at least to reexamine the term, and if we continue to use it, think about what it should mean for the challenges of the 21st century, not for those of the 20th.

CONCLUDING THOUGHTS

The world is facing challenges in the 21st century that are very different from those in the 20th. Income inequality is increasing and shows no sign of abating. The enemies of civilization are no longer clearly defined hostile national entities, but rather rapidly shifting terrorist groups. Technology is providing some jobs but also eliminating many others. Competition is global rather than local. And nations possess weapons of mass destruction that are under the control of present and perhaps future

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leaders whose trustworthiness with the destructive power they hold is, at the very least, questionable. This volume is unlike others in the field of giftedness: It seeks to understand the term “giftedness” in the context not just of past and contemporary challenges, but also of future challenges, some of which hold the power to destroy civilization as we know it. The volume represents the kind of thinking for where the field of giftedness needs to go, not just where it has been.

NOTES

- ¹ The term globalization signifies the massive socioeconomic, technological, and cultural integration of populations around the world (see Beneria, 2003; Goldin & Mariathan, 2014; Rodrik, 2007; Sen, 2010; Stiglitz, 2003; Tsing, 2004). More details about the nature of globalization and the problems and opportunities it creates appear in the next chapter of this book.
- ² Prominent scholars from various disciplines argue that we have reached a point where our influences on the biosphere can spin out of control and precipitate the implosion and disintegration of life-sustaining systems some time in the 21st century. The next chapter in this book provides more detail.
- ³ The essentialist conception of giftedness revolves around gifted-nongifted distinctions based on the permanence of general intelligence. See David’s chapter for details.

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2. TWENTY-FIRST CENTURY CONTEXTUAL INFLUENCES ON THE LIFE TRAJECTORIES OF THE GIFTED AND TALENTED

This chapter represents an attempt to shed more light on the long-term development of the gifted, talented, and creative by placing that development in a large-scale context of 21st-century trends, which include *macroproblems* and *macro-opportunities*. Macroproblems are high-impact, global, long-term, transdisciplinary difficulties that threaten to harm or even devastate the lives of billions around the world (Ambrose, 2009a; Ambrose & Sternberg, 2012; also see Hunter, 1991). They are global because they span international boundaries and cannot be solved from within the borders of a single nation. They are long term because they derive from dogmatic thinking, neglect, and often corruption over years, decades, or even centuries and, consequently, will take long periods of time to solve. They are transdisciplinary because no single discipline encompasses sufficient expertise to address them fully so their solution will require collaboration across disciplines. Examples of macroproblems include climate change; looming resource shortages; the erosion of democracy; and severe inequality in a globalized socioeconomic system increasingly driven by dogmatic, market-fundamentalist ideology. In contrast, macro-opportunities are unprecedented circumstances that can lead to significant advances in well-being for billions of individuals and to ethically guided progress for societies. Examples include powerful new forms of scientific networking, innovative technologies, and the strengths of diverse minds when grouped together for complex problem solving.

This analysis emerges from an extensive, interdisciplinary search for theory and research pertaining to the discovery and development of aspirations and talents within influential socioeconomic, political, ideological, and cultural contexts. I draw from significant work in economics, political science, sociology, social epidemiology, ethical philosophy, history, complexity theory, the environmental sciences, psychology, creative studies, gifted education, and other disciplines to develop a metaphorical model representing the impact of 21st-century globalization on the development of societies, the evolution of education systems, and the life chances of individuals. After illustrating the structure and dynamics of two different versions of the model, I describe some of the most impactful 21st-century macroproblems and macro-opportunities and the demands they are making on our knowledge, skills, and dispositions.

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CATCH A WAVE: A METAPHORICAL LANDSCAPE FOR THE DEVELOPMENTAL TRAJECTORIES OF CIVILIZATIONS, EDUCATION SYSTEMS, AND CREATIVELY INTELLIGENT INDIVIDUALS

The “catch a wave” model, which takes different forms in Figures 1 and 2, provides a metaphorical landscape illustrating the importance of rethinking education – especially gifted education – in rapidly evolving and challenging 21st-century socioeconomic, political, and cultural contexts. The two versions of the wave model represent two different levels of analysis – the societal level shown in Figure 1 and the level of the education system shown in Figure 2. The models provide frameworks for understanding large-scale contextual threats and opportunities, which are revealed by scholarship in a variety of disciplines. The structure and dynamics of each model portray the profound changes that have been taking place since the mid-20th century. Implications for gifted education, general education, and creative studies can be derived from the models because the knowledge, skills, and dispositions required decades ago no longer are sufficient for success in the 21st century.

Societal Context: Will Our Civilization Thrive or Collapse?

Figure 1 shows the societal level of analysis, portraying the success or failure of the globalized, Westernized, market-driven socioeconomic and cultural system that dominates most of the world in the 21st century. The depth dimension on the left side of the model signifies the passage of time from the early to mid-20th century on into the 21st century. The top surface of the model, moving from left to right, signifies a metaphorical landscape along which a society or civilization can advance through more or less effective economic, sociopolitical, and cultural policies and initiatives. The vertical dimension represents the achievement of societal success, conceived of here as the ability of a society to remain viable over the long term while lifting the vast majority of its citizens toward ethically guided self-fulfillment.

On the surface at the back of the model a straight arrow moving from left to right represents the trajectory of Western society in the early-mid 20th century. Despite a few intermittent stall outs (e.g., the Great Depression, WW II), our civilization at that time moved forward predictably on a linear path toward success; however, that success was somewhat limited, signified by moderate elevation as the culture progressed toward the right-rear sector of the model. In a century dominated by modernist ideology throughout most of the developed world (see Inglehart, 1997) success as a society primarily meant enabling entrepreneurial capitalists to build a level of prosperity (broadly shared in some nations, not in others) based on the extraction and refinement of natural resources. While resource shortages and environmental problems were emerging in that era they did not dominate and societal collapse was on the seemingly distant horizon. The noticeable but somewhat limited level of success in the back, right-hand sector of the model represents the way in which the dominant conceptions of societal and individual fulfillment were

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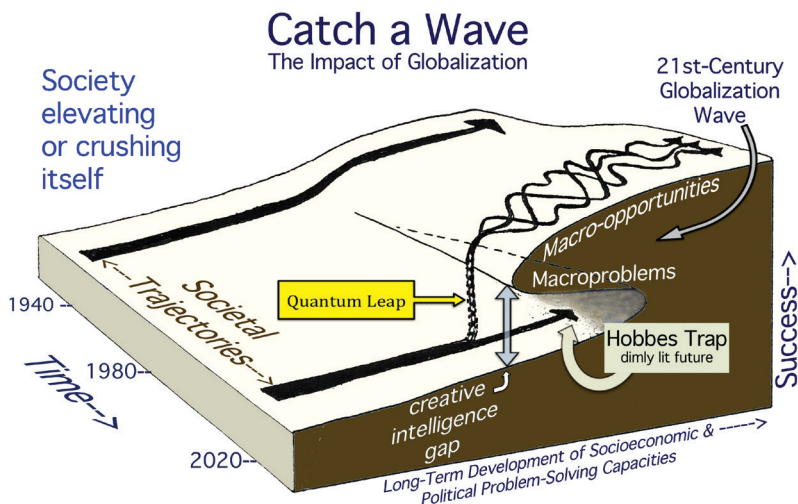


Figure 1. 21st-century model showing the impact of globalization on societies

confined to notions of materialistic gain. But success in 20th-century societies could have been more pronounced (higher on the model). According to the prominent ethical philosopher Alan Gewirth (1998), high-level human fulfillment requires the discovery of altruism-flavored aspirations and the concomitant discovery and refinement of capacities (i.e., talents) for development that goes far beyond materialistic-individualistic vainglory.

The wave on the right, front of the model represents the effects of globalization, which entails massive economic, technological, and cultural integration of populations around the world (see Beneria, 2003; Goldin & Mariathasan, 2014; Rodrik, 2007; Sen, 2010; Stiglitz, 2003; Tsing, 2004). Globalization brings with it large-scale problems and opportunities, which are deemed macroproblems and macro-opportunities because of their enormous impact (Ambrose, 2009a; Ambrose & Sternberg, 2012).

Macroproblems show up on the underside of the globalization wave signifying their colossal impact when they come crashing down on populations that are mired in a devastating, miserable place shown here as the *Hobbes trap* (a dimly lit future). Those unfortunate enough to find themselves stuck in that trap will endure lives that are *poor, nasty, brutish, and short*, to borrow words from the pessimistic, 17th-century philosopher Thomas Hobbes (1985/1651). This trap denotes a wretched, disaster-plagued collective existence featuring severe resource shortages, environmental destruction, economic collapse, widespread eruptions of warfare and genocide, and other disasters caused by the inability or unwillingness of a society's leaders to deal with pressing macroproblems and to capitalize on macro-opportunities. Societies

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can move blindly forward into the trap if they are too dogmatic and ill prepared to recognize and grapple with the demands of the 21st century.

Here is more detail about the dimly lit future in the Hobbes trap. Decades ago, a volume written by environmental scientists – *The Limits to Growth* (Meadows, Randers, Meadows, & Behrens, 1972) warned about the need for more attention to resource shortages and environmental stewardship. The authors outlined some possible future scenarios, some involving societal collapse. Later they published a follow-up report showing how considerable sustainability problems still persisted on the large scale (Meadows, Randers, & Meadows, 2004). More recently, investigators from various fields, most of them employing interdisciplinary analyses, have pointed toward the strong possibility of a major collapse of modern civilization in the 21st century, similar to the collapses that took place in prior civilizations such as those of the Romans, the Mayans of Central America, the Mauryan and Gupta Empires of ancient India, and the Khmer of Southeast Asia.

There is, however, a difference between today's situation and the conditions that provoked most of the earlier collapses. The worldwide socioeconomic integration brought about by globalization could make a societal collapse spread around the globe instead of staying localized as they did in the cases of most ancient civilizations. An early example of rapid, widespread collapse occurred when the well-integrated, thriving civilizations of the late Bronze Age rapidly broke down precisely because that integration provided a network for the spread of systemic problems (see Cline, 2014). But a 21st-century collapse could be much more widespread and occur much more rapidly due to the far more substantial economic and technological integration of today's globalization.

A word of caution is in order here. Societal critiques often come with warnings that the sky is falling. A prominent example was the Y2K frenzy that preceded the coming of the 21st century. Such warnings tend to come and go leaving us skeptical about future expressions of concern pertaining to macro-sociopolitical and economic phenomena. We should be wary of chicken-little warnings that emerge from within the borders of single disciplines, or from nebulous, intuitive impressions about macrophenomena. Nevertheless, this skepticism should not make us immune to warnings that emerge from triangulation of findings from credible researchers in multiple disciplines. The warnings about macroproblems and the possibility of widespread, societal collapse in the Hobbes trap discussed in this chapter emerge from some of this transdisciplinary triangulation.

For example, prominent thinkers making arguments about the possibility of massive, widespread, societal collapse include political scientists Thomas Homer-Dixon (2000, 2001, 2006) and Leslie Paul Thiele (2013); historians of science Naomi Oreskes and Erik Conway (2013); geographer Jared Diamond (1992, 2004); sociologist William Robinson (2014); physicist Michael Nielsen (2011); geo-ecologist Wolfgang Lucht (2010); anthropologist Joseph Tainter (1988); environmental scientist Vaclav Smil (2008); environmental studies scholar David Orr (2012); archaeologist Harvey Weiss and geoscientist Raymond

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Bradley (Weiss & Bradley, 2014); philosopher Bruce Edmonds (2015); business-management scholar Jorgen Randers (2012); systems scientist Safa Motesharrei, political scientist Jorge Rivas, and environmental scientist Eugenia Kalnay (Motesharrei, Rivas, & Kalnay, 2014); and biologists Paul and Ann Ehrlich (2013). While holding out some hope that we might avoid large-scale collapse through unprecedented, collaborative creative problem-solving they point out the likelihood that we will not be able to overcome the gap between our current cognitive abilities, in a collective sense, and the enormous problems we face. Homer-Dixon (2000) termed this the *ingenuity gap*, arguing that a civilization like ours facing huge resource shortages and environmental devastation will need unprecedented levels and forms of ingenuity to avoid *synchronous failure* – the simultaneous disintegration and implosion of life-sustaining systems on a very large scale. Synchronous failure in collapsing societies usually leads to widespread, violence-saturated anarchy. Nielsen and Diamond made similar arguments about the mismatch between collapsing societies' cognitive abilities and the enormous problems they confront.

In order to connect this analysis with research in creative studies and gifted education I use the term *creative intelligence gap* to stand for Homer-Dixon's notion of the ingenuity gap. The creative intelligence gap shows up on the model as the daunting space between the lower surface, where a society is poised to wander ahead blindly and dogmatically into the dimly lit future of the Hobbes trap, and the much higher, optimism-generating surface on top of the globalization wave.

In stark contrast, and fortunately for us, the macro-opportunities show up on the top of the wave because they promise to lift populations that are well prepared for the 21st century to a very high level of success. A society that is well aware of 21st-century problems and opportunities and generates the ethically guided creative and critical thought capacities necessary for addressing those problems and opportunities will be able to make the quantum leap to the crest of the wave and follow an exciting, unpredictable developmental path. The unpredictability is signified on the model by the multiple, interweaving arrows on the top of the wave.

The quantum leap on the model plays a gatekeeping role for a society aspiring to success in the 21st century. It represents a society's discontinuous jump from the lower level to the top of the wave. This jump is based on an analogous phenomenon in theoretical physics in which a subatomic particle instantaneously moves from one energy level to another with no apparent "in between" transition status (see d'Espagnat, 2006; Omnès, 1999). Similarly but on a much larger scale, a society aspiring to reach the top of the globalization wave must make a discontinuous leap in terms of its collective creative and critical thought processes and problem-solving actions. The analogy of *discontinuity* applies here because *continuing* past practices, for example, following established thought paradigms and socioeconomic and cultural procedures, which often are habit bound and saturated with dogmatism (see Ambrose, 2012a, 2012b), will be insufficient at best and devastatingly counterproductive at worst.

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In order to understand the need for the quantum leap to the crest of the globalization wave we must analyze some examples of the macroproblems and macro-opportunities that make up the underside and topside of the wave. The examples listed in the subsections below are potentially high-impact, or already so; however, different or additional examples could have been included. I encourage readers to suggest others.

Examples of Macro-Opportunities

Exponential knowledge growth. Advancements in information technology and scientific networking are spurring knowledge growth in many academic disciplines and professional fields, some of which feature enormous additions to their knowledge bases (see Arbesman, 2012; Motta, 2013; Zander & Mosterman, 2014). It will tax our collective minds to master and use all of this knowledge; however, rapidly expanding knowledge bases in many fields present us with a macro-opportunity – arming us with unprecedented volumes of scientific and technical knowledge as well as better understanding of the human condition. This expanded knowledge provides raw material that gives us the potential for strengthening our creative intelligence. In turn, if we are sufficiently wise we can apply the enhanced cognitive skills to the solution of our most pressing macroproblems.

Cognitive diversity. Subra Suresh (2013, October), former director of the National Science Foundation and chair of the Global Research Council, argues that international, transdisciplinary collaboration among scientists is becoming the new norm in scientific work, largely because innovation accelerates when research teams include diverse ideas and perspectives. Along similar lines, in a large-scale analysis of group problem-solving outcomes in a wide variety of organizational contexts, economist and complexity theorist Scott Page (2007, 2010) revealed that cognitive diversity provides significant advantages when it comes to grappling with complex problems (also see West & Dellana, 2009). A cognitively diverse problem-solving team encompasses diverse theories, and/or problem-solving heuristics, and/or belief systems.

For example, such a team might include individuals trained in counseling psychology, economics, biology, engineering, philosophy, and the visual arts. One individual on this team might have expertise in quantitative-empirical research methods while another might be a natural ethnographer. Yet another individual might be a strong group facilitator. Some members of the team might adhere to liberal-progressive ideology while others might be more conservative. In contrast, another team might consist of intelligent, highly skilled individuals but all of them are economists who adhere to the rational-actor theory of the individual, possess the same highly refined quantitative model building skills, and strongly believe in laissez-faire, neoliberal ideology.

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Now assume that both teams are trying to solve the same problem. Even if the cognitively diverse group possesses less intelligence, collectively speaking, than the homogenous group of economists its cognitive diversity makes it likely to outperform those economists as long as the problem is complex and not solely about economics. Of course, a cognitively diverse, highly intelligent team will perform even better. Interestingly, cognitive diversity turns into a disadvantage when it comes to simple, algorithmic problems.

Given the increasing complexity of problems in the 21st century, cognitive diversity is important now and will become even more essential in the years to come. In addition, it is becoming more feasible because 21st-century networking technology enables clusters of diverse minds to come together much more easily than they could in the past. As Page (2007, 2010) noted, we can think of cognitive diversity as a key attribute for group effectiveness. In addition, we can think of it as an important attribute of *individual* minds. An individual who is able to build a personal problem-solving toolbox, which includes diverse theories, disciplinary perspectives, methodological tools, and belief systems, will benefit from cognitive eclecticism in a world that demands the intellectual flexibility of cognitive diversity.

Unprecedented scientific and artistic networking. Nielsen (2011) described the inception of highly effective, unpredictably emergent online collaborative projects that have led to solutions for previously unsolvable mathematical and scientific problems. For example, in the polymath project an eminent mathematician was making little headway in an attempt to solve a very difficult mathematical problem that always had stymied great mathematical minds. After posting what he had done online and inviting suggestions for next steps, ideas began to flow in from very diverse mathematical thinkers from around the globe. Some who contributed useful pieces to this complex puzzle were other leading mathematicians but many of the contributors were much less distinguished. In a short period of time the problem was solved.

While the solution to the problem was inaccessible to a single mathematical genius or even to a collaborative team of genius mathematicians, the unpredictable, organic-emergent intermixing of many pieces of *microexpertise* turned out to be the key. The term microexpertise signifies bits of knowledge and skill that are distributed throughout a population. While an eminent expert in a domain has mastered an impressive array of knowledge and skill, that expert simply cannot possess all of the relevant puzzle pieces when it comes to today's increasingly complex problems, even when those problems are domain specific. Consequently, she/he cannot match the collective mass of microexpertise bits possessed by hundreds or thousands of individuals around the globe even though none of those individuals could match the eminent expert in a one-on-one intellectual contest in that domain. The notion that "none of us is as smart as all of us" actually is true when it comes to this kind of networked problem solving.

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Some other examples of the phenomenon come from the galaxy zoo project; a competition between the world's greatest chess player and the unpredictably emergent teamwork of many lesser players around the world; the spontaneous global networking of contributors to an open architecture project for the design of innovative buildings in the third world; and an open-source, game-based process that enables skillful visual thinkers to invent new proteins for attacking diseases. In the galaxy zoo project, for instance, astronomers realized that they couldn't possibly analyze all of the data coming in from powerful new telescopes so they decided to build a website and invite outsiders to look for patterns in space. The results have included highly productive discoveries of new types of galaxies and other space-based phenomena. Nielsen went so far as to suggest that these emergent, online collaborations very well could represent the beginning of the next scientific revolution.

Similar, unpredictably emergent, online collaborations are coming forth in other dimensions of human experience. For example, in the arts, composer-conductor Eric Whitacre has been pulling together emergent, highly proficient and creative virtual choirs from around the world (see Webb, 2010).

Example of a Macroproblem/Macro-Opportunity Hybrid

Runaway technology. While electronic networking is advancing, so are other forms of technology. Rapid advances in digital technologies are promoting unprecedented levels of economic productivity and creating seemingly boundless opportunities for innovations in a variety of industries (Brynjolfsson & McAfee, 2014). Developments in materials science, including nanotechnology, the science of engineering matter at very small molecular and atomic levels (Interrante & Chandross, 2014; Khan, 2012), and biotechnology, the science of re-engineering life itself (Carlson, 2010; Harris, 2007; Rose, 2006), are accelerating rapidly. Technological systems for generating and exploiting green energy are improving and have the potential to replace dirty energy sources such as coal and oil (Prentiss, 2015). They also could provide strong opportunities for job creation while reining in environmental destruction and climate change (Gallagher, 2014). Among other purposes, advances in materials science such as nanotechnology innovations could revolutionize our development and use of materials for construction and engineering, giving us opportunities to make stronger, lighter vehicles, machines, and buildings with smaller carbon emission costs. Biotechnology could solve some of our most difficult medical and food-shortage problems. The emerging science of synthetic biology is especially promising because it provides the potential for transforming our material world (see Bonnet & Subsoontorn, 2012; Bonnet, Yin, Ortiz, Subsoontorn, & Endy, 2013; Kahl & Endy, 2013). Just one example of many possible applications is the production of new, exceptionally strong and biodegradable building materials.

Nevertheless, unpredictable events occur in complex systems (Jervis, 1997; Miller & Page, 2007; Page, 2010; Thompson, 2007) and unexpected, harmful effects

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from runaway technology always loom on the horizon (Ravetz, 2010; Tonn & Stiefel, 2012). For example, the unprecedented prosperity generated by the digital revolution, termed the *second machine age* by Brynjolfsson and McAfee (2014), is flowing into the hands of a few while the wages of the many are stagnating and unemployment is growing. These harmful effects can derive from accidental misuse of new technology, unanticipated implications of the application of new technology, or unethical, exploitative applications by bright but unscrupulous individuals and groups.

Farther out on the time horizon a more devastating problem might arise from unpredictable developments in artificial intelligence. According to Bostrom (2014), humanity lacks sufficient long-range vision to guide the development of potentially powerful artificial intelligence innovations toward the betterment of future lives. Instead, short-range profit seeking drives artificial intelligence developments and future advances in this area could spin out of control as increasingly clever artificial minds, unguided by ethics, outpace the development of our own cognition. Consequently, rapid advances in new technologies potentially represent both macro-opportunities and macroproblems.

Examples of Macroproblems

Resource depletion. The BP oil disaster in the Gulf of Mexico foreshadowed another pressing macroproblem – a looming shortage of resources such as hydrocarbons, minerals, fresh water, and arable land (see Daly & Farley, 2010; Friedrichs, 2013; Klare, 2012; Prior, Giurco, Mudd, Mason, & Behrisch, 2012; Rockström et al., 2014). Klare (2012) illustrated ways in which these shortages are encouraging extraction industries to take ever-bigger risks such as deep-water drilling and mining in dangerous regions because easily accessible resources are disappearing quickly. In the case of oil and gas extraction, the shortages are encouraging a frenzied chase for “unconventional hydrocarbons” such as those found in the tar sands of Western Canada and the difficult-to-release natural gas deposits that are being accessed through hydraulic fracturing. These extractive processes are far more damaging to the environment than conventional oil and natural gas extraction, and those processes were dirty enough. Consequently, the energy industry is causing far more devastating environmental damage than ever before, and this damage includes the rapid acceleration of climate change (see the next macroproblem).

The potential for dangerous international conflicts over territory and resources also is rising due to the shortages. For example, nations are saber rattling and building up their military capacities in anticipation of conflicts over oil and gas resources in Southeast Asian waters and in the Arctic Ocean, which is being made more accessible to drilling due to climate change. In addition, wealthy nations such as Saudi Arabia and the United Arab Emirates are buying up enormous tracts of arable land in third-world countries in order to ensure their own food supplies at the expense of the impoverished populations in those nations. International tensions are

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rising over this practice. In the long run, we must either use our ingenuity to come up with replacements for some of these resources or pay gargantuan ethical and economic prices for them in the future. Klare (2012) terms this macroproblem the *race for what's left*.

Environmental devastation and climate change. Insufficiently regulated, globalized capitalism coupled with population growth has been aggravating one of our longest running macroproblems—environmental pollution. Climate change likely is the worst manifestation of this problem and, in and of itself, possibly represents our second-most-dangerous macroproblem because it threatens the viability of life on earth as we know it (see Archer, 2009; Duménil & Lévy, 2013; Flannery, 2006; Friedrichs, 2013; Nordhaus, 2013; Pellow, 2002; Sherwood & Huber, 2010; Verchick, 2010). Even now, climate change is magnifying the power and frequency of high-impact storms worldwide, causing severe heat waves and desertification of large tracts of land, precipitating mass extinctions in the biosphere, establishing conditions favorable to widespread epidemics, and setting the stage for huge, disastrous mass movements of environmental refugees around the world.

Distortions of globally networked capitalism, and severe inequality. The trend toward economic globalization over the last several decades has freed up entrepreneurial enterprises while tying the hands of regulators who are charged with protecting the interests of national and regional populations from exploitative economic practices. The exploitation includes rapacious raiding of natural resources and race-to-the-bottom outsourcing of previously secure first-world jobs to deplorable third-world sweatshops. The result has been a morphing of somewhat beneficial capitalism into a distorted system of exploitative global economic domination (see Ambrose, 2011, 2012; Applebaum, 2005; Arvidsson & Peitersen, 2013; Block & Somers, 2014; Brown & Jacobs, 2008; Blyth, 2013; Chang, 2007; Christensen, 2011; Daly & Farley, 2010; Garrett, 2014; Gilman, 2015; Harvey, 2006, 2007, 2010; Kotz, 2015; Kasser, Cohn, Kanner, & Ryan, 2007; Kuttner, 2013; Pasquale, 2015; Piketty, 2014; Posner, 2009; Robinson, 2014; Sachs, 2011; Santoro & Strauss, 2012; Sassen, 2014; Stiglitz, 2010, 2012, 2015; Zucman, 2015). This domination has led to a pervasive form of *slow violence* – a form of long-term attrition destroying the life support systems of billions throughout the world (see Nixon, 2013).

The exacerbation of already serious economic inequality within and between nations (Piketty, 2014; Stiglitz, 2012, 2015; Wilkinson & Pickett, 2009) is an enormous, spinoff macroproblem deriving from these distortions of capitalism, which ironically emerged as a system for freeing the masses from exploitation under the thumb of European aristocracies in centuries past and was not intended to serve unfettered greed, individualistic vainglory, and the feathering of privileged nests (see Fleischacker, 2004; Muller, 1995; Sen, 2010). If the trend toward even more severe inequality continues, humanity faces a highly unethical divide between a small number of immensely powerful, selfish plutocrats and the vast majority of

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miserable, exploited, and denigrated citizens whose insecure, impoverished lives are poor, nasty, brutish, and short, to borrow descriptors again from the 17th-century philosopher Thomas Hobbes (1985/1651). The division of populations into exploitative elites and exploited commoners has been a primary reason for societal collapses throughout history (Motesharrei, Rivas, & Kalnay, 2014) so the severe inequality macroproblem is particularly worrisome.

Democratic growth and erosion. Democracy is not an either-or political condition. Instead, it is a complex political system characterized by shades of gray ranging anywhere from vibrant, participatory governance systems to near totalitarianism (see Ackerman, 2010; Ambrose, 2005; Gutmann, 2003; Hacker & Pierson, 2005, 2010; Harvey, 2006; Roberts, 2010; Ringen, 2007; Wolin, 2008; Yamin & Ambrose, 2012). Some nations are more democratic than others and no perfect democracy has existed yet on earth, at least not on a national scale. Interestingly, democracy has been expanding around the world (United Nations, 2002), spreading into third-world nations at the same time that it has been eroding in many developed nations (see Gilman, 2015; Kurlantzick, 2013).

A democratic government tends to erode when the population of a nation polarizes ideologically and then one side comes to dominate the system (Bermeo, 2003; Gutmann & Thompson, 1996). Most often, this manifests in the form of extreme left-wing ideology (e.g., the Pol Pot regime of Cambodia, the Stalinist Soviet Union) or extreme right-wing ideology (e.g., the Pinochet regime in Chile, Nazi Germany).

In a particularly worrisome example of democratic erosion, leading political scientists have shown that the United States has been going through this polarization process and has been shifting toward right-wing extremism over the last several decades (see Hacker & Pierson, 2005, 2010; Wolin, 2004, 2008). Disturbing consequences include mass deception of the citizenry and the erosion of civil liberties. When a democracy erodes, the political and economic levers of the nation are commandeered by unscrupulous, dogmatic elites, and the media is manipulated to spread propaganda in order to keep the populace ignorant and compliant. Evidence of democratic erosion in the United States comes from the dominant influence of plutocratic money in the political system through the power of lobbying and the ways in which the shortsighted, ideologically tainted Supreme Court *Citizens United* and *McCutcheon v. Federal Election Commission* decisions enormously magnified the influence of money in politics (see Gilman, 2015; Hacker & Pierson, 2010; Teachout, 2014).

Additional evidence comes from the replacement of objective, investigative journalism, which is designed to seek out and shed light on corruption, with industrial journalism, which tends to ignore or hide corruption. When the media is dominated by industrial journalism, arguments between entertaining but vacuous talking heads provide superficial, distorted, biased messages about what's going on in the world and the public lacks the knowledge necessary for participation in the democratic process (Belsey, 1998; also see Starkman, 2014). In view of its recent

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acceleration, democratic erosion in developed nations, especially in the United States, is becoming another serious macroproblem because the short-term wants of a few plutocrats (e.g., oil barons, inheritors of immense fortunes, financial industry insiders) trump the needs and rights of the vast majority. Note that the effects of this macroproblem correspond with the effects of the severe inequality macroproblem because the political and economic systems in the developed world are so closely intertwined. Consequently, these two macroproblems mutually reinforce.

Dangerous dogmatism. Shortsighted, narrow-minded, superficial, dogmatic thinking might be our most serious macroproblem because it is pervasive and causes most of our other macroproblems. Dogmatism is a major contributor to everything from creativity killing school-reform initiatives; to misconceptions about creativity and giftedness; to reckless, enormously damaging economic policy; to foolhardy military aggression; to ethnic conflict; even to the extremes of genocide (see Ambrose, 2009a; Ambrose & Cross, 2009; Ambrose & Sternberg, 2012; Ambrose, Sternberg, & Sriraman, 2012; Granik, 2013). Interestingly, gifted and creative individuals are not immune to dogmatism (Elder & Paul, 2012). Understanding and successfully grappling with the human penchant for dogmatic thought and action is a necessary step toward solving most of our other unrelenting macroproblems.

Taken together, the enormity and pressing nature of these macro-opportunities and macroproblems will demand more creative intelligence than humanity has ever been able to muster. An education that can help young people overcome the creative intelligence gap and make the quantum leap to the crest of the wave in the 21st-century model in Figure 1 will aim at the development of a very different, more complex set of abilities than those provided by the 3R's education of the not so distant past.

EDUCATION SYSTEMS: A BIG-PICTURE ANALYSIS THROUGH THE LENS OF THE CATCH A WAVE MODEL

As mentioned earlier, the catch a wave model applies at multiple levels of analysis. Now that I have used Figure 1 to consider 21st-century trends and issues at the panoramic, societal level I narrow the scope somewhat to analyze ways in which education systems are evolving within the context of 21st-century globalization.

In Figure 2, the dark, left-to-right trajectory arrows on the surface represent the attempts educators and educational leaders make over the long term to create educational philosophy, curriculum, and instruction that will enable students to aspire, achieve, and ultimately succeed in their adult lives. The vertical dimension represents the extent to which this work actually does lead to authentic, long-term student success as opposed to superficial, short-term success signified by shaking out inauthentic grades.

On the surface at the back of the model the straight arrow moving from left to right now represents the trajectory of an education system in the early to mid-20th

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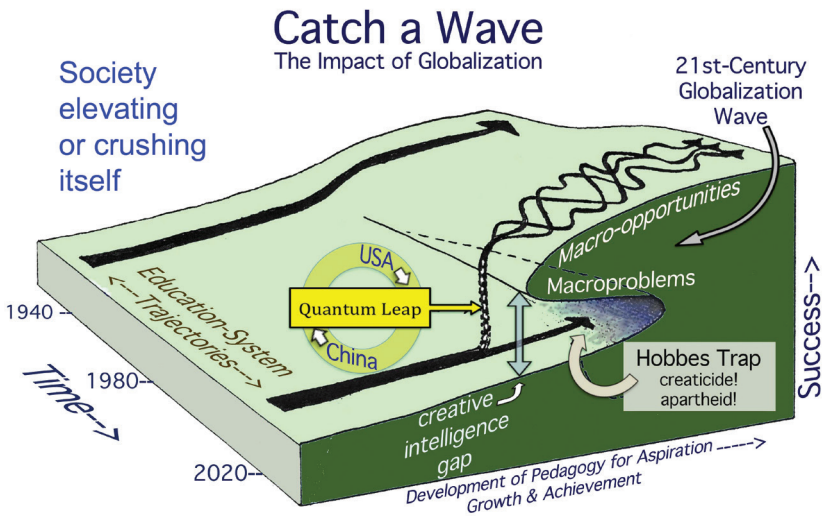


Figure 2. 21st-century model showing the impact of globalization on education systems

century. In that era, educational success was considered to be the result of pedagogy that could provide basic, domain-specific knowledge and skills; consequently, success represented by the elevation in the back corner of the model was moderate, if it was achieved. It was moderate because it was missing some important elements, which will become clear later in this analysis.

The dark, left-to-right trajectory arrow on the near-side surface of the model represents the trajectory of an education system in the 21st century. If the philosophy, curriculum, and instruction of the education system does not match 21st-century demands it will push millions of students into the Hobbes trap where they ultimately will be crushed by the macroproblems on the underside of the globalization wave. If instead the education system matches 21st-century demands it could provide millions of students with the discontinuous, quantum leap to the crest of the globalization wave where they will be able to capitalize on the unprecedented macro-opportunities.

Using the American education system as an example, the Hobbes trap generates *creaticide* and *apartheid* that derive from current pressures to push American education back toward alignment with the worst forms of 19th-century pedagogy. For example, David Berliner (2012) coined the term *creaticide* to stand for the systematic killing of creativity in the American education system. The murder of creativity comes from dogmatic adherence to accountability initiatives driven by widespread, high-stakes measurement of superficial, narrow abilities through standardized testing. The term “apartheid” appears on the model because it signifies the pressure that influential but dogmatic, ignorant, and unscrupulous profit-seeking educational reformers are putting on school systems to impose more high-stakes

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testing, quasi-militaristic discipline, and barren, robotic instructional methods throughout the schools while cleansing them of higher-order thinking (see Berliner, 2009, 2011, 2012; Berliner & Glass, 2014; Fabricant & Fine, 2013; Horn & Wilburn, 2013; Kozol, 2005; Lubienski & Lubienski, 2014; Nussbaum, 2010; Ravitch, 2010, 2013). This situation magnifies educational apartheid because school systems run along these lines suppress the life chances of the deprived while the privileged enjoy elite school experiences unencumbered by accountability mania (for more on the magnification of privilege through exclusive educational opportunities for elites see Khan, 2010). Young people forced into this trap will have little to no chance of overcoming the enormous creative intelligence gap (represented by the vertical double arrow) and making the quantum leap to the crest of the globalization wave.

Notice that the quantum leap on this version of the model has some symbolism indicating an ironic race between the world's two most powerful nations. A circle on the model shows the USA near the top but moving downward and China near the bottom but moving upward. Recently, several leading thinkers in general education, gifted education, and creative studies have discussed, independently, the problem of the USA dropping in terms of emphasis on creativity and some of them have portrayed China, which is notoriously noncreative in its education system, as desperately trying to become more creative. For example, Yong Zhao (2009, 2013, 2014) argued that China is trying to revamp its excessively mechanistic, noncreative, accountability driven model and align it more with the creative, constructivist, student-centered approach found in many American classrooms. Similarly, Kyung Hee Kim (2011) suggested that American emphases on standardized testing are de-emphasizing creative thinking while Asian school systems are attempting to replicate the American system due to its past success with creative learning. David Dai (personal communication, November 15, 2012) has taken on a project to translate scholarly books on creativity into Chinese because leaders in the Chinese system want it to become more creative. Further illustrating the irony of the circle on the model in Figure 2, Jonathan Plucker was cited in "The creativity crisis" (2010), a *Newsweek* article in which he relayed the bemusement of Chinese colleagues who said "you're racing toward our model. But we are racing toward your model, as fast as we can" after he told them about American reform initiatives and accountability systems.

In essence, the societal catch a wave model in Figure 1 and the model in Figure 2 showing the challenges of the 21st century for education systems reveal some extremely high-stakes concerns for citizens, policymakers, educators, and the children they serve and mentor. The perilous Hobbes trap, featuring a dimly lit future in the societal model and creaticide/apartheid in the educational model, becomes something even more pernicious when it is applied to the future lives of today's children. If our societal leaders are unwise, dogmatic, and unscrupulous they will deny educational leaders and teachers opportunities to create an education system capable of lifting millions of children up toward to the macro-opportunities on the top of the globalization wave. Instead, it will force educators to operate fearfully in barren, hyper-mechanistic, quasi-militaristic, 19th-century ways and millions of

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children will be pushed forward into the dingy, dangerous, oppressive region under the macroproblems on the underside of the globalization wave. Here, their lives will be poor, nasty, brutish, and short while they are being crushed inexorably by those macroproblems.

In the Hobbes trap they will suffer from unrelenting insecurity and severe economic deprivation deriving from reliance on increasingly rare and far more expensive natural resources as well as the destitution that comes from exploitation of the vast majority by a few extremely powerful, selfish, unethical plutocrats who monopolize the levers of an increasingly distorted form of hegemonic, globalized capitalism. They will suffer from human-rights abuses that ensue from the erosion of democracy, the aforementioned economic exploitation, and the escalations of mass conflict that occur when populations face severe, unprecedented environmental stressors. In addition, they likely will face as yet unimagined difficulties that will come from the unpredictable negative effects of runaway technology.

Should they escape the Hobbes trap and make the quantum leap, today's children, tomorrow's adults, will have opportunities to sample a profusion of enormously appealing prospects heretofore undreamt. This especially will be the case for the gifted and creative. They will be able to contribute to, and benefit from, numerous, rapid leaps forward in scientific innovation and knowledge, which will emerge from the meshing of micro-expertise through networked, interdisciplinary science. They will find creative, ethical new ways to make the powerful, innovative capacities of globalized capitalism work for the good of the vast majority instead of for the benefit of a selfish, vainglorious, hyper-materialistic, well-positioned few. They will come up with ways to solve our current resource shortages while creating a new era of environmentally friendly abundance. Most importantly, they will diminish violence and greed by capitalizing on cognitive diversity, developing their creative intelligence, and dismantling the dogmatism that plagues so many in so many ways.

TWENTY-FIRST CENTURY KNOWLEDGE, SKILLS, AND DISPOSITIONS

The high-impact globalization wave shown in the catch a wave model in Figure 2 requires more than rote learning of easily measured knowledge and skills. Such an education may have sufficed in the early to mid-20th century, as shown by the linear life trajectory arrow in that region of the model. But the quantum leap to the crest of the wave will require an extensive range of other abilities, which are outlined in the list to follow. We could argue that only the gifted few with leadership potential need to master the daunting list of proficiencies in this list. Moreover, we could claim that these gifted individuals need not address the entire range of proficiencies. Instead, they could specialize and count on widespread collaboration among specialists to solve macroproblems and capitalize on macro-opportunities. Such an argument makes some sense because it would be extremely difficult for anyone to master all of the proficiencies. However, the majority of citizens, designated gifted or not, will need to develop some understanding of

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21st-century challenges and opportunities while developing some level of expertise with these proficiencies because today's enormous challenges require at least some participation of citizens en masse and the generation of the political will necessary for tackling unprecedented macroproblems and capitalizing on unprecedented macro-opportunities. We need widespread citizen awareness and support for the work of experts in the various domains relevant to each macroproblem and macro-opportunity.

The following is an extensive, and likely incomplete, list of knowledge, skills, and dispositions that might give us a chance to make the quantum leap to the crest of the globalization wave while avoiding the Hobbes trap. Elements in the list were inspired by a helpful analysis of 21st-century skills provided by Dede (2010) while some other elements came directly from prior interdisciplinary explorations of contextual pressures in today's world (e.g., Ambrose, 2009). In the descriptions below, the selected aspects of knowledge, skills, and dispositions were connected with and adapted to the macroproblems and macro-opportunities described earlier in this chapter:

Broad and Deep Proficiency in the Subject Areas

Due to the complex, transdisciplinary nature of today's macroproblems and macro-opportunities education must be comprehensive, addressing diverse concepts in multiple disciplines. Contrary to the direction imposed by major school-reform initiatives; which narrow and fragment the curriculum, forcing it to address easily measured, superficial knowledge and skill in literacy and mathematics (see Berliner, 2006, 2009, 2011, 2012; Berliner & Glass, 2014; Nichols & Berliner, 2007; Ravitch, 2010, 2013; Zhao, 2009, 2012); today's students need deep-level cognitive and affective immersion in a variety of subject areas including literacy, the arts, mathematics, the sciences, world languages, history and governance, and geography. "Deep level" means grappling with interesting problems in the subjects and mastering key concepts instead of just learning superficial facts and basic mechanics for standardized testing.

Creative Thinking Skills and Inquiry-Based Dispositions

Given the unpredictable, evolving conditions of the 21st-century globalized context, today's students must learn to generate insightful ideas, adapt, innovate, and problem solve when confronted with uncertain, nebulous, threatening technical, socioeconomic, and cultural circumstances (see Sternberg, 2009a, 2012). "Inquiry-based" dispositions entail the development of keen interest in digging into the core of puzzling situations and interesting phenomena. These skills and dispositions may be particularly important when it comes to the development of gifted young people (see Renzulli, 2012).

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Critical Thinking Skills and Dispositions

The most effective thinkers find ways to generate both creative and critical thought. The latter requires nuanced judgment (see Elder & Paul, 2012; Paul & Elder, 2002; Resnick, 1987), which allows an individual to perceive shades of gray in complex 21st-century issues instead of falling prey to dogmatic, polarized, either-or thinking. The ability to critically pick out important patterns in complex, messy data is another crucial element of critical thinking in today's world. These abilities will enable citizens and leaders to (a) select and refine the most promising creative ideas while problem solving and adapting, and (b) recognize and deal with macroproblems, ethical dilemmas, and dogmatism.

Interdisciplinary Thinking

As mentioned earlier, the ever-more-complex macroproblems of the 21st century cannot be solved from within the confines of insular disciplines (Ambrose, 2009a). For example, one of our largest and most pressing macroproblems – climate change – will require natural scientists, social scientists, policymakers, and a *strong critical mass of citizens* to understand ways in which theory and research from climate science, economics, political science, ethical philosophy, and other disciplines must interweave to create a coherent strategy for grappling with this enormous issue, which threatens our very survival as a species.

More specifically, ideas from economics alone can tell us how to operate more efficiently as economic actors but the dominant conceptual frameworks of that field obscure the cost of externalities, which are hidden production and environmental costs shifted from corporations onto the shoulders of innocent bystanders (Ambrose, 2011, 2012; Green, 2009; Stiglitz, 2010). Confining our thinking to economics allows a few big players in the energy extraction industry to exploit petrochemical resources while ignoring and externalizing the cost of environmental damage, thereby pushing that severe cost onto the rest of humanity. Insights from political science can reveal ways in which exploitative, anti-democratic forces deceive the general public into supporting policies antithetical to their personal interests and the long-term interests of humanity. Ethical philosophers can reveal additional nuances and implications of this deception.

Visual-Spatial Literacy

Those with strong visual-spatial thinking ability are capable of creating and interpreting conceptual models representing complex systems and issues. They can generate and understand intricate, graphic models incorporating large amounts of data from multiple sources. Visual-spatial ability always has been important for work in the STEM (science, technology, engineering, and mathematics) arenas

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(see O’Boyle, 2008; Rocke, 2010; Root-Bernstein et al., 2008; Root-Bernstein & Root-Bernstein, 2013; West, 2009). The 21st century is demanding more STEM expertise (see Subotnik, Olszewski-Kubilius, & Worrell, 2012). Moreover, the STEM professions are requiring more visual-spatial talent than ever before because they rely more heavily on computer technology with ever more sophisticated analytic and synthesizing graphics.

Imagine yourself propelled back in a time machine to the late 1970s or early 1980s to view the operation of computer systems of that era. You would see small, black monitors with horizontal rows of amber or green symbols – and absolutely no graphics. Such an environment favored logical, linear-sequential, symbolic thinking and made little room for visual-spatial talent. Now travel forward into today’s high-tech organizations where you come across high-powered computer systems with enormous, high-resolution monitors showing highly complex, periodically morphing 2-D and 3-D visual models that synthesize enormous amounts of complex symbolic data. Highly skilled visual-spatial thinkers are at a premium in these STEM environments.

Visual models also can be used to synthesize theory and research from multiple disciplines to shed light on complex issues that require transdisciplinary syntheses. An example is a two-dimensional graphic synthesizing scholarship from political science, economics, journalism, history, ethical philosophy, creative studies and gifted education to clarify the dynamics and effects of democratic erosion in various national contexts (Ambrose, 2005; Yamin & Ambrose, 2012). Another example is a three-dimensional graphic-metaphorical earthen landscape within an imaginary glass cube several thousand miles on a side (see Ambrose, 2009b). The model synthesizes scholarship from ethical philosophy, political science, economics, primatology, history, creative studies and gifted education to clarify the ethical dimensions of high ability.

Without the development of visual-spatial talent we will be wandering blind, at least to some extent, in the midst of highly complex macroproblems and macro-opportunities that demand graphic conceptual syntheses. Those with considerable visual-spatial talent will find themselves well suited to these complex, cognitive demands. Moreover, those lacking visual-spatial talent also will be well served if they experience an education that enables them to appreciate and understand visual-spatial conceptual models and syntheses to the extent possible.

Information-Technology Skills

The aforementioned high-powered computer systems in STEM labs are only the tip of the technology iceberg in the 21st century. Computerized technology is ubiquitous in virtually all dimensions of our lives from the business world, to education, to healthcare, to environmental stewardship, and beyond (Kaku, 2011; Levy, 2010; Zhao, 2012). Today’s students and citizens must be able to function in a complex, technological environment and to keep abreast of rapid changes in technological

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systems and infrastructures. If successful, some of them will function as highly innovative technologists and virtually all of them will function as knowledgeable consumers of information technology. Ideally, most also will function as citizens who influence policy decisions about the ways in which new technologies are used in our societies.

Financial, Business, Economic, and Entrepreneurial Acumen

While the early to mid 20th century provided a relatively stable, predictable work environment, the 21st century is anything but stable. Corporate globalization has created a rapidly shifting, unpredictable economic system in which money and information instantaneously pass through porous international borders, regional business regulations are weak and transitory, work is outsourced to third-world sweatshops, and entrepreneurial opportunities appear and disappear at breakneck speed (Turner, 2011; Xiang, 2007). In such an environment, today's young people must become financially savvy and entrepreneurial about their own long-term career trajectories.

For example, according to Xiang the globalized information technology industry engages in the practice of "body shopping," which entails hiring information technology workers from anywhere in the world and farming them out to do piecework projects, also anywhere in the world. When a project is completed these workers are "benched" without significant income or benefits until the next project comes along. In such conditions of insecurity and unpredictability the only way to survive and possibly thrive is to develop one's talents to the maximum and then market those talents as one would an entrepreneurial startup firm.

Intrapersonal Self-Discovery and a Sense of Purpose

Closely related to the need for viewing one's own talent development in entrepreneurial terms is the wisdom of magnifying one's own intrapersonal insight and a sense of direction. Gardner (1983, 2006) highlighted the importance of intrapersonal intelligence, which entails the ability to recognize and assess our strengths, weaknesses, talents, and interests, and to use these discoveries to develop adaptive but purposeful self-direction. Gruber (1989) also emphasized the ways in which highly creative people establish purposeful self-direction throughout the lifetime. Renzulli (2012) described a set of co-cognitive factors that enable individuals to develop commitment and purpose. Among other elements, these factors include sensitivity to human concerns, optimism, courage, a sense of destiny and the notion that one has the power to initiate needed changes. The Roeper School in Bloomfield Hills Michigan provides a particularly successful example of an institution that enables gifted young people to develop Gardner's intrapersonal intelligence; to engender Gruber's purposeful, lifelong, creative self-direction; and to generate Renzulli's co-cognitive factors (see Ambrose, Sriraman, & Cross, 2013).

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In view of the highly complex, ever-shifting conditions of the globalized 21st-century, intrapersonal self-discovery and long-term purposeful self-direction appear to be more important than ever before. Those who can discover their passions and maximally develop strong, innate talents related to those passions, and then look for opportunities to apply these abilities to promising niches in a turbulent world will maximize their chances of surviving and thriving.

Cognitive Diversity

Cognitive diversity (Page, 2007, 2010), one of the macro-opportunities discussed in an earlier section of this chapter, represents a dimension of creative intelligence that can give individuals and groups a better chance of making the quantum leap to the crest of the globalization wave. The intermixing of diverse theories, problem-solving heuristics, and belief systems gives individuals and groups better chances to solve complex problems. Given the increasing complexity of problems in the 21st century, developing cognitive diversity in individual minds and in collaborative groups is important now and will become even more essential in the years to come.

Interpersonal Ability, Collaborative Skill, and Leadership

Returning to the issue of group problem solving, it can be difficult for people of diverse belief systems to work together so interpersonal, collaborative skills also are becoming more important in an integrated, globalized world. The days of the lone genius are disappearing (Gribbin, 2007; Suresh, 2013, October) and, as mentioned earlier, today's complex problems and opportunities demand the efficient intertwining of diverse minds (Page, 2007, 2010). Interpersonal acumen and collaboration always have been important but they are becoming more essential in view of today's macroproblems. Strengthening our collaborative abilities will enable us to lead, follow, and contribute to innovative team projects that employ diverse minds. Artfully sensing *when* to lead, follow, or collaborate is an important dimension of this ability. Overall, the need for creative, intelligent, wise, non-egocentric leadership is pressing (see Gardner & Csikszentmihalyi, 2011; Jacobsen, 2009; Sternberg, 2005, 2009a, 2009b).

Ethical Insight, Global and Multicultural Awareness, and Personal and Social Responsibility

Ethics always represent the most important dimensions of human experience. This is especially the case when it comes to the actions of the gifted, talented, and creative because their work often has more profound impact on the world (for detailed discussions about this impact see Ambrose & Cross, 2009; Sternberg, 2013). The emergence and expansion of macroproblems and macro-opportunities

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in the 21st century magnifies the importance of ethics even more. If we don't include ethical elements in our attempts to solve macroproblems or to capitalize on macro-opportunities we are likely to make those problems worse and to turn macro-opportunities into even more macroproblems. For example, it looks like the energy industry's use of hydraulic fracturing to solve the energy shortage macroproblem has the potential to seriously aggravate another macroproblem – environmental devastation (Hagström & Adams, 2012).

International conflict and the maltreatment of deprived populations within nations and around the globe is another macroproblem threatening the wellbeing of billions. In large part, conflicts and exploitation tend to arise from superficial misunderstandings between cultures. For example, scholars of ethical philosophy and political science have revealed distinctions between universalist and particularist morality (Gewirth, 1998). Individuals and groups with moral compasses guided by universalist identity formation make no strong distinctions between their own identity groups and populations of "outsiders." In contrast, particularists can be kind and generous toward those within their own identity group but draw strong distinctions between those of their own kind and outsiders. They find it easy to demonize those from other cultural, ethnic, religious, racial, gender, or class backgrounds and such demonization can lead to ethical abuses up to and including the horrors of genocide (Chirot, 2012; Chirot & McCauley, 2006). Building global awareness and cultural competence can shed light on the dogmatism of insular identity formation and enable identity groups to break down the racist and ethnocentric barriers that justify conflict and exploitation (see Banks, 2012; Ford, 2012; Noddings, 2005; von Károlyi & Ambrose, 2008). In short, an education that doesn't include strong attention to ethical awareness will be inadequate and possibly dangerous in the complex, globalized 21st-century (see Gardner, 2008, 2012).

CONCLUDING THOUGHTS

Overall, this analysis is based on an incomplete selection of 21st-century macroproblems and macro-opportunities. This chapter was just a starting point. A more extensive exploration of the highly complex, transdisciplinary conceptual terrain addressed here likely would turn up even more problems and opportunities that might refine our thinking about the knowledge, skills, and dispositions required for success in the 21st century. Consequently, the list of requirements for development of the creative intelligence necessary for the quantum leap to the crest of the globalization wave in the catch-a-wave models also may be incomplete. Even so, the list of 21st-century proficiencies provided here is daunting and those proficiencies are difficult to attain. Those who can aspire to the acquisition of these capacities and then develop the requisite aspirations and talents will be able to maximize their own chances for self-fulfillment while simultaneously helping to heal a problem-fraught world. They might even help us prevent the most massive, devastating collapse of civilization in human history. Those who lack opportunities

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for developing these abilities, or for even perceiving the possibility of developing them, are at a distinct disadvantage in the 21st century.

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SECTION II

CONCEPTIONS OF GIFTED EDUCATION IN A COMPLEX, CHANGING WORLD

DAVID YUN DAI

3. ENVISIONING A NEW CENTURY OF GIFTED EDUCATION

The Case for a Paradigm Shift

The gifted education movement as launched in the beginning of 20th century in the United States (Henry, 1920) is way beyond its 100-year anniversary. Since we entered the global knowledge age and creative economy in the 21st century, gifted education has gained added importance. If we take “creative intelligence” as a collective human capital (Florida, 2002) crucial for the well-being and prosperity of the human society in the 21st century, gifted education has made its share of contributions in the past and should have a more prominent role to play in the future. However, as the focus chapter (Ambrose, chapter 2, this volume) points out, there are many macroproblems deeply entrenched in the social and conceptual systems that prevent us from taking advantages of many opportunities the 21st century offers. For one, the prevailing categorical approach to gifted education established in the 20th century (the gifted vs. non-gifted bifurcation) and some deeply rooted essentialist thinking supporting this approach are untenable in light of current thinking about human potential and the preponderance of research evidence; the related identification and education practices have also become increasingly inadequate (and sometimes detrimental) in responding to the call for developing the many and varied talents needed for the 21st century. In this chapter, I first delineate current research and theoretical advances on the nature and nurture of creativity and how they pose challenges to the essentialist assumptions and the categorical approach. I then argue that the categorical approach (e.g., the Gifted Child Paradigm) is falling short when scrutinized in terms of scientific credence, equity concerns, and educational productivity. In comparison, a talent development approach to gifted education (i.e., the Talent Development Paradigm) is scientifically more compelling, socially more equitable, and educationally more productive. In conclusion I call for a paradigm shift in gifted education that responds to the emergent opportunities and challenges in 21st century, and leads the way in promoting knowledge capital, talent, and creativity development essential for the vitality of individuals and society in the 21st century.

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NEW INSIGHTS FROM RESEARCH ON CREATIVITY AND CREATIVITY EDUCATION

Gifted education has long been a pioneer in teaching and learning for creativity and innovation (Renzulli, 1977) and has had an impact on regular classroom teaching (Tomlinson & Callahan, 1992). However, it also tends to see itself as having a separate identity, apart from the rest of education, in the name of serving “special needs” of gifted students. Conceptualized this way, gifted education has been more or less insulated from a broader educational perspective on creativity education. In general education, researchers have also explored ways of teaching and learning that makes productive use of knowledge more likely. The new trend is characterized by exploring new possibilities for creative learning through social interaction, technological support, and personalization of learning and knowledge (Scardamalia & Bereiter, 2006; Zhang, 2012).

The thrust of this line of research on teaching and learning for creativity comes from a realization, attained a long time ago, that learning can be truly a creative act or a form of creative cognition (i.e., learning is generative; Bruner, 1960) and that novelty in thinking can be engendered through active learning (Torrance, 1963). The current movement is poised to “naturalize” creativity. Naturalizing creativity means that creativity is not some kind of special processes humans deployed for special purposes (making creations) but is the product of natural human quests for meaning, truth, and optimality. Naturalizing creativity is also based on the argument that creativity originates in situated actions rather than mere ideation; that is, creativity does not start with novel ideas but with meaningful tasks, actions, and interactions from which creativity emerges over time (Sawyer, 2006b), a view reminiscent of Torrance’s (1970) and Renzulli’s (1978) conceptions of creative productivity. Consequently, creativity enhancement efforts need to be repositioned seamlessly in daily transactions in natural settings, rather than packaged as “creativity training.”

Historically, learning is often perceived as an act of absorbing knowledge created by others (indeed perpetuated by some psychological research paradigms), with the teacher serving as a medium. There is a correspondence between the teacher’s input and students’ output. Scardamalia and Bereiter (2006) challenged this notion of learning. In their model of the Knowledge Building community that engages students in what they called “creative knowledge work” (Scardamalia & Bereiter, 2006, p. 98), the line between learning and creative thinking is blurred. For example, the work of fifth graders on Gregor Mendel’s problem of genetics is seen as “continuous with that of Gregor Mendel, addressing the same basic problem” (p. 98). This way, the role of learners as creative agents is redeemed. Different from static, individualistic conceptions of intelligence and creativity, in which giftedness is attributed to individuals, this new approach is committed to the “relational ontology” of human functioning (Barab & Plucker, 2002; Gresalfi, Barab, & Sommerfeld, 2012). So construed, gifted learners are those who continually engage in an active, critical

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way of learning through which information is transformed into personal knowledge and new insights into the world are achieved (Dai, 2012; Gee, 2007; Perkins, 2009). Learning in this sense is not merely preparation for creativity. Learning is a way of keeping an innovative edge.

Another way of “naturalizing” creativity is to highlight personal creativity as ubiquitous to human beings when they are allowed to freely choose and develop their own unique repertoire of knowledge, skills, and values (Feldman, 2003; Runco, 2010; Collins & Halverson, 2009). Ultimately, “little c creativity” in the form of personal knowledge (Polanyi, 1958) and creative interpretation (Beghetto & Kaufman, 2010) becomes a primary source of eminent adult creative productivity (“big C creativity”; Csikszentmihalyi, 1996).

In sum, the recent research and theoretical thinking has explicated many principles espoused by pioneers of gifted education. It takes two forms, leveraging the power of a community in building new understandings and cognitive apparatus, and developing personal creativity by carving one’s own developmental niche. Assessment of creativity is taking an increasingly flexible approach, tracking processes rather than merely gauging products, moving away from parametric assumptions of individual differences to contextualized diagnosis of progress and shortfalls (e.g., Shute & Kim, 2012). Instead of using individuals as a unit of analysis, dialogic interactions and collaborative discourses become an empirical basis for assessing creative dynamics (Sawyer, 2006a). In light of these fundamental changes in how we understand creative potential, it is necessary for education to reposition itself as a primary force for nurturing creativity.

THE LEGACY AND LIABILITY OF THE GIFTED CHILD PARADIGM

As I wrote above, gifted education is a vital force in nurturing creativity and has made contributions to education for creativity in the past. However, I also suggest, as many others point out (e.g., Borland, 2003), part of the legacy of gifted education has become a liability if we look forward to another century of gifted education of the kind fit to serve the emergent challenges of the 21st century. I have recently proposed a three-paradigm framework as an effort to understand the current state of gifted education (Dai, 2011; Dai & Chen, 2013, 2014). Relevant to the topic of this chapter, the Gifted Child Paradigm (GCP) has been a dominant approach to gifted education for the past century, and still is. The paradigm is characterized by the *status definition* of gifted children, the *categorical approach* (gifted-non-gifted bifurcation), and the *essentialist conception* of what constitutes this form of exceptionality (assumed to be a homogeneous group distinguished from the rest by their mental qualities, and permanent over time). In the following section, I explain why this approach is falling short and is even antithetical to progress in light of the new theoretical and practical landscapes of education I have delineated earlier.

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The Essentialist Conception of Giftedness is Not Scientifically Convincing

The Gifted Child Paradigm (GCP), as part of the legacy of gifted education, is heavily built on general intelligence (Spearman's *g*; Spearman, 1904) as its theoretical foundation and on psychometric measurement (IQ testing and the assumption of its distribution in a population) as its technology. It is predicated on the essentialist conception of giftedness as having an essence ("general intelligence") that holds its identity (the gifted-nongifted qualitative difference assumption), unity (the homogeneity assumption), and continuity over time (the permanence assumption). It is important, therefore, to get a good sense of how we currently understand the nature of intelligence construed as an individual difference variable.

From a common perspective, *intelligence* refers to a set of cognitive abilities important for learning and problem solving, such as understanding complex ideas, engaging in various forms of reasoning, and effectively dealing with real-life challenges (Neisser et al., 1996). Whether IQ measures can adequately capture this quality worthy the label of "general intelligence" is a controversial matter (Gottfredson, 1997; Sternberg, 1997). First, intelligence tests apparently measure something important, likely related to a person's cognitive efficiency (e.g., working memory capacity) or sophistication (e.g., metacognition, strategy use, etc.; see Dai, 2010). However, the cognitive differences between the "gifted" and the "nongifted," whenever found, are a matter of degree, rather than of a different kind as prescribed by the GCP (Steiner & Carr, 2003). The *qualitative difference assumption* does not hold.

Second, it seems that intelligence is too broad, abstract, and elusive a concept to be amenable to psychometric measurement as one dimension or a rank order score. At face value, standard intelligence tests provide a composite score by sampling a variety of task performances (mostly an academic kind). This is an empirical approach to test development deliberately used by Binet and Simon to represent a wide variety of task conditions for the sake of enhancing its practical utility (diagnosis of general academic difficulties). However, precisely because of the empirical approach, there is a level of arbitrariness as to what to include in such a test; in other words, the measurement is atheoretical. The paradox is that the broader range of tasks a test samples, the less psychologically meaningful the test becomes (i.e., what exactly it measures; see Lohman & Rocklin, 1995). In other words, construct validity becomes problematic. Whatever the case, one thing is clear: the measurement so derived is a mixed bag of many things, rather than one thing. Two persons getting the same IQ score likely have differing cognitive profiles, particularly if scores significantly deviate from the norm particularly at the upper end (e.g., in the "gifted" range; see Detterman & Daniel, 1987; Jensen, 2001; Wilkinson, 1993). In short, the *homogeneity assumption* does not hold.

Thus, a status definition of giftedness (e.g., top 3 percent of the population based on IQ or other equivalent standardized measures) also implies permanence of giftedness, interpreted as general intelligence or otherwise. Indeed, perpetuated

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by early pioneers like Terman and Hollingworth (see Robinson & Jolly, 2014), the gifted range of IQ scores is considered a proxy measure for “natural endowment” or natural aptitude apart from achievement (Gagné, 2005). So defined, it is not only assumed to be invariant over time; its correlation with achievement is claimed to reflect a cause-effect relationship.

This interpretation has been seriously challenged (Lohman, 2006; Lubinski, 2004). Sternberg (1999) argued that, even though such predictive validity is well established, no causal priority can be inferred between intelligence measures and achievement measures because abilities measured by intelligence tests are forms of developing expertise, which itself is a kind of achievement and at least mediated by experiential and environmental influences. Ceci and Williams (1997) provide evidence that the timing and duration of schooling has a direct impact on fluctuations of IQ scores. Lohman and Korb (2006) show that, due to the regression to the mean as well as developmental timing (late vs. early bloomers), a large proportion of children (in some situations estimated as much as 60 percent) identified as “gifted” in elementary years will fall out of the gifted range if tested later in high school years. They also point out the instrument-dependent nature of identification (using a slightly different instrument you will identify a different set of individuals as “gifted”). What appear to be objectively measured “mental qualities” turn out to depend on many factors, genetic, developmental, environmental, as well as technical. In short, the *permanence assumption* does not hold. Taken together, the essentialist conception of giftedness, on which status definition of giftedness and categorical approach to gifted education is based, commits the error of reification (Borland, 2003), taking something non-descriptive or abstract as real and explanatory (see also Peters et al., 2013, for a critique).

While the psychometric measurements and theories of general intelligence have been scrutinized, new theories of intelligence have started to redefine the nature of intelligence, considering a broader range of parameters, with profound implications for how giftedness should be defined. Perkins (1995; Perkins & Grotzer, 1997) identified three broad classes of theories of intelligence (hence, three main sources of intelligent behavior): neural, experiential, and reflective. *Neural Intelligence* refers to the contribution of biological variations in neural efficiency, either globally or in a modular form, that supports cognitive functioning. *Experiential Intelligence* refers to the contribution of experience and knowledge to crystallized and fluid intelligence, particularly domain-specific knowledge and skills that are highly tuned to particular types of information or environment. And *Reflective Intelligence* refers to the contribution of metacognition and reflective self-guidance to intelligent behavior. Whereas neural efficiency has been argued for quite some time to be a biological advantage that distinguishes gifted children from their age peers (Gallagher, 2000; Geake, 2008, 2009), experiential and reflective aspects of intelligence have yet to gain prominence as a basis for identifying gifted children or nurturing gifted potential. What Perkins’s eclectic view of intelligence suggests to the field of gifted education is that conceptions of giftedness should allow for

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the role of self-engendered cognitive and metacognitive action, and environmental stimulation and support. Just as intelligence can be seen as developing expertise (Sternberg, 1999), expertise can be seen as learned intelligent behavior (experiential intelligence in Perkins's term).

This changing conception of intelligence represents a trend away from the essentialist approach toward a more functional approach. Gardner (2003) articulated this new trend succinctly when he identified an alternative definition of intelligence as "fit execution of a task or role" (Gardner, 2003, p. 48; see also Newell, 1990). Thus the Brazilian children who successfully peddled their goods, or the professional gamblers who excelled in betting, show such "fit execution" regardless of whether or not they do well on IQ tests. Conceptualized as such, intelligence denotes a dynamic, effective functional state vis-à-vis an adaptive challenge, rather than a static personal trait, and it should be assessed with task-specific criteria rather than a contentious set of tasks presumed to measure a general quality of mind. The same can be said about creativity (e.g., Sawyer, 2012; see earlier discussion of changes in conceptions of creativity).

If intelligence or creativity is seen not as a trait, but as a functional state in particular contexts (Ziegler, 2005), then dispositions such as sensitivity to occasions that call for a particular way of thinking, and inclination to engage in such thinking (Perkins & Ritchhart, 2004), or personality characteristics such as openness to new experience (Stanovich & West, 1997) can influence the quality of thinking (i.e., intelligent behavior). Ackerman (1999; Ackerman & Kanfer, 2004) also highlights dispositional factors by making a distinction between *maximal intellectual performance* typically gauged in testing conditions, versus *typical intellectual engagement* observed in real-life situations. This functional view of intelligence provides clues as to how emergent conceptions of giftedness can go beyond the entrenched ability-centric view to include other aspects of the person, such as cognitive motivation and intellectual character (Ritchhart, 2001; Perkins & Ritchhart, 2004). Taken together, the new theoretical thinking favors a more contextual, dynamic, and developmental view of giftedness (Dai, 2010).

The Categorical Approach Is Exclusive and Socially Inequitable

The categorical approach uses a status definition of giftedness; you are either gifted or not gifted. It works like a membership system and shuts its door to non-members, just as fraternities and sororities reject certain men and women. The GCP holds a "mental quality" (e.g., high intelligence) view of giftedness, whereas the other two paradigms hold the "competence" view of giftedness. Competence can be domain-specific and continually changing with maturation and educational experience, but "mental qualities" are assumed to be highly stable (or even fixed) and essential. The problem with the "mental quality" view of giftedness is that it turns an epistemic question of whether a person is ready for an educational experience into a value judgment, as if those with allegedly high "mental qualities" automatically deserve

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a privileged educational status or present “special needs,” and those who lack these “mental qualities” are less worthy of advanced educational opportunities. This approach is vulnerable to charges of elitism (Margolin, 1994) and raises equity concerns. Indeed as envisioned by Terman (1925), education of the gifted is unapologetically elitist. Although advocates of GCP may argue that it is a merit-based system, a merit-based education system should be based on what one can do, rather than what one is (Dai, 2015). It is not convincing why, for example, only those with an IQ or GPA in the top five percent should enjoy enrichment learning experiences. After all, the cutoff used for gifted-nongifted bifurcation is in a way arbitrary (Hertzog, 2009; Treffinger & Feldhusen, 1996).

In sum, the categorical approach to gifted education (gifted vs. non-gifted) unduly (and often arbitrarily) limits participation in advanced learning to only a very small percentage of students; the criteria (e.g., IQ or GPA) used to identify the “gifted” are too general to allow a variety of talents to be recognized by the system. As discussed earlier, the diversity and heterogeneity of human potential simply defies the Procrustean Bed of IQ scores.

Generic Provisions Based on the “Unique Needs” of the Gifted Are Not Educationally Productive

From an educational point of view, a productive and effective system defines its goals clearly and fashions proper ways to accomplish them. In this regard, GCP also falls short. As we shall see, the shortfalls identified below are rooted in the essentialist conception of giftedness.

Identification based on “general aptitude.” By nature, the purpose of identification under GCP is to establish gifted status and eligibility, not for specific educational purposes (i.e., irrespective of what educational opportunities will be offered). This identification practice may be effective for screening and selection/placement purposes but has little to say about what specific educational goals and approaches are appropriate for particular individuals (Callahan, 1996). A dramatic example would be someone who has demonstrated academic excellence in an area, yet in order to be eligible for gifted services still has to be tested according to the state eligibility requirements, which, by the way, are usually not specific to the nature of the educational opportunities he or she is seeking. Pertinent to the effectiveness issue, the question is which piece of information is more informative for educational purposes, an IQ score or demonstrated strengths and interests in authentic educational settings? The answer is obviously the latter (see Lohman, 2005; Peters et al., 2014; Treffinger & Feldhusen, 1996 for critiques), but for eligibility purposes, the former is calling the shots.

Defining goals based on alleged “unique needs.” Indeed, the educational rationale for why these individuals should be selected in the first place also becomes

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problematic. Some may argue that “leadership” is the most appropriate goal; others believe that “social and emotional needs” of the gifted are more important. Whether excellence should be featured prominently is also debated (see Grant & Pichowski, 1999). The notion of generic “gifted” programs or a singular “gifted” program is based on the assumption of a unique educational mission specific to the “gifted.” Alas, research efforts to find the Holy Grail of giftedness once and for all largely have failed (Dai, 2010; in press), so have the efforts to find a curricular and instructional identity for gifted education that is different from that of general education (Tomlinson, 1996; Kaplan, 2003). These efforts failed because the assumptions of homogeneity and permanence of the essentialist conception of giftedness do not hold, and the resultant categorical approach is inconsistent with the principle of *increasing differentiation* (Dai, 2010) and continuities and discontinuities of individual development (Feldman, 2003) in the making of giftedness and talent.

Insulation from “general” education. Gifted education also tends to see itself as having a separate identity, apart from the rest of education, in the name of serving “special needs” of gifted students. Conceptualized this way, gifted education becomes insulated from a broad educational perspective, and even perceived by some outside critics as a life boat some desperate (and privileged) students are trying to hold onto while the Titanic of education is sinking (Gallagher, 1996; Sapon-Shevin, 1996)! Precisely because gifted education seeks its own identity based on what is unique about giftedness, it does not have effective communication with the reform movements in general education. As I indicated above, there are many advances in educational research concerning to how to facilitate authentic learning, talent development, and creative productivity in the classroom and beyond (e.g., Baker, 2007; Scardamalia & Bereiter, 2006; Gee, 2007; Sawyer, 2006b), and how to develop critical and creative thinking skills and dispositions crucial for the 21st century (Partnership for 21st Century Skills, 2008; see Ambrose, chapter 2, this volume). Many opportunities to collaborate with researchers and educators from “general education” on infusing advanced learning and talent development in the school system and making gifted education an integral part of education have not been pursued. This disconnect makes gifted education at risk of becoming irrelevant in the larger scheme of education (Borland, 1996, 2003).

Slow in response to the changing world. Preoccupations under GCP with “giftedness” and “unique needs” make the field slow to respond to opportunities related to the varied and many ways in which talent and personal creativity can be cultivated. For example, although there have been explorations in using technology to enhance the capacity and quality of gifted education (e.g., Renzulli Learning), compared to the broad field of education, practice and research in this area for the purpose of promoting advanced learning and creativity education is weak, to say the least (see Chen, Dai, & Zhou, 2013). Adherence to the Gifted Child Paradigm is often at the cost of forgoing many educational opportunities opened up in the

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information age, formally and informally, to advance the development of a variety of talents and the creative potential in a responsive manner (Collins & Halverson, 2009; Craft, 2010).

Taken together, GCP is falling short in making the education of gifted and talented individuals effective. I even venture to argue that it impedes the progress that could have been made in the field if the categorical approach were not institutionalized in many of the United States and if the essentialist conception were not deeply entrenched in the practitioners' and researchers' belief systems.

WHY THE TALENT DEVELOPMENT PARADIGM IS A BETTER ALTERNATIVE

Talent development approaches to gifted education that go beyond the IQ doctrine first emerged in the Sputnik period and grew rapidly in the 1980s and 1990s (e.g., Bloom, 1985; Csizsentmihalyi, Rathurd, & Warran, 1993; Feldhusen, 1992; Feldman, 1992; Gruber, 1986; Lubinski & Benbow, 1992; Mönks & Mason, 1993; Piirto, 1994; Renzulli, 1978, 1986; Stanley, 1996; Tannenbaum, 1983), and have become more pronounced in the past decade or so (Horowitz, Subotnik, & Matthews, 2009; Lohman, 2005; Simonton, 1999, 2005; Subotnik, Olszewski-Kubilius, & Worrell, 2011). Although taking many forms and approaches in practice, the Talent Development Paradigm (TDP) holds a more pluralist and developmental view of human potential, and its practice is not driven by status but by one's demonstrated potential or aptitude for a particular line of talent development. Contrary to the standard image of high "gifted" intelligence translated into real life excellence or giftedness translated into talent under GCP, TDP sees talent (human potential) as contextually and dynamically shaped and manifested through interactions with the environment, becoming increasingly differentiated and integrated over time. It is not preoccupied with the question of what makes giftedness but instead focuses on "giftedness in the making" (Dai, 2010, p. 196).

Developmental Conceptions of Giftedness and Talent Are Scientifically More Compelling

There are many conceptual models of giftedness. What is common among them is the assumption that giftedness not as a static quality fixed in the mind but the result of the confluence of several forces, endogenous and exogenous, coming together in the right place at the right time. Renzulli (1986) makes this most explicit by arguing that "gifted behaviors take place in certain people (not all people), at certain times (not all the time), and under certain circumstances (not all circumstances)" (p. 76) (see also Feldman, 1986; Simonton, 2005). The following are three assumptions of the developmental perspective on the nature of giftedness and talent:

- *The state assumption.* Because of the emphasis on the evolving nature of human potential for a particularly line of talent development, TDP does not *a priori*

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assume that giftedness is an absolute condition of exceptionality; rather, it is an evolving state. This position stands in sharp contrast to the essentialist assumption of giftedness as homogeneous and permanent (i.e., as a personal trait, pervasive across situations and invariant over time).

- *The diversity assumption* implies a variety of niche potentials and developmental trajectories and pathways in talent development that do not share the same essential characteristics, cognitively or affectively. One can be gifted in one way but not gifted in another. Developmental diversity is a joint function of biological diversity (e.g., different abilities, sensitivities, and inclinations) and environmental diversity (e.g., different domains, different social contexts, and different cultures). This assumption contrasts with the homogeneity assumption held by GCP.
- *The developmental assumption*. Development means a gradual process of structural and functional changes through differentiation and integration over time. Early manifestations of high potential do not guarantee later success, as task environments at a higher level of development impose new demands and constraints. As a result, some stand out while others fade away (Lohman, 2005; Simonton, 2005). Being gifted or talented has different meanings at different stages of talent development (Dai & Renzulli, 2008; Subotnik & Jarvin, 2005). In short, it refutes the permanence or innate assumption.

From a research point of view, a talent development focus renders the immediate phenomenology of talent manifestations more important (Feldman, 1986; Witty, 1958). A major change from essentialism to developmentalism is an epistemological shift, from an *a priori* assumption or theoretical formulation of what constitutes giftedness [what Sternberg and Davidson (1986) called *implicit theory*], to a focus on the observed phenomena of gifted behavior or competence in authentic functional contexts and how it develops. Therefore, the predictive validity of high IQ or other psychometric test scores and justification of their use, while still useful, is no longer a research priority. Rather, understanding the phenomenology of how individuals achieve high-level expertise and creative productivity every step of the way becomes a focus in its own right. This new focus also helps ease the tension in theory and research between a focus on gifted potential in childhood and eminent accomplishments in adulthood (Siegler & Kovsky, 1986). This epistemological shift has led to methodological innovations, such as case studies (Feldman, 1986), retrospective interviews (e.g., Sosniak, 2006), biographical studies (Gardner, 1993; Gruber, 1981), experiential sampling (Csikszentmihalyi et al., 1993), and discourse analysis for assessing creative dynamics (Sawyer, 2006a). What becomes the focal point is the developing person as a whole, instead of abstract concepts such as general intelligence or specific abilities based on factor analyses of psychometrically defined variables measured in a decontextualized fashion (Carroll, 1993). Theoretical thinking is no longer ability-centric (e.g., what cognitive abilities the gifted possess), but integrating cognitive, affective, and motivational processes

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(e.g., Dai & Sternberg, 2004; Shavinina & Ferrari, 2004; Winner, 1996). Taken together, the Talent Development Paradigm provides a more coherent and viable theoretical foundation for gifted education and a scientifically more compelling and useful framework for education policy and practice.

Talent Development Approaches Are More Inclusive and Are Socially More Equitable

Because it does not assume exceptionality (the gifted-nongifted bifurcation), the Talent Development Paradigm allows for maximal participation in a wide range of culturally valued endeavors. As Renzulli (1998) put it,

Our vision of schools for talent development grows out of the belief that everyone has an important role to play in the improvement of society and that everyone's role can be enhanced if we provide all students with the opportunities, resources, and encouragement to develop their talents as fully as possible. (p. 107)

This orientation is in line with the call for a more equitable education for all in the 21st century (Ambrose, chapter 2, this volume). Equity is achieved by breaking the IQ dogma and through enhancing a diverse pool of talent. Indeed, motivations for broadening the conceptions of giftedness in history were equity concerns and social equality concerns (Renzulli & Reis, 1991). The approach does not mean excluding those with high IQs; rather, whatever contributions "general aptitude" might have made should be reflected in the talent development and manifestations of talent. It becomes truly a merit-based rather than status-based approach, based not on alleged "mental qualities" but demonstrated competence and potential in pursuit of a particular line of work. Equity is also achieved through consultation and self-selection when a range of opportunities is made available in and outside of school (Barron, 2006). Equity is further enhanced when the system has checks and balances that ensure that opportunity is truly taken (Subotnik et al., 2011) and commitment and progress are evident (participants in good standing).

Talent Development Approaches Are Educationally More Productive in Terms of Promoting Optimal Individual Development

Generally speaking, regarding talent and creativity as contextually developed makes the role of education more prominent and strategies more targeted.

Identification based on authentic assessment of strengths and interests. Because talent development is always domain-specific, criteria for selection can be more easily made sensitive to threshold domain requirements and developmental levels and stages (Lohman, 2005), to be matched with the educational goals in a situation, and assessments are readily interpretable (psychologically and educationally more

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meaningful and informative). Note that what gets identified is not a class of people but educational opportunities based on strengths and interests in particular lines of development that are personally meaningful and culturally valuable (Renzulli & Dai, 2003).

Clearer educational goals, fashioned proactively as well as reactively, and better defined curriculum and pedagogy. As indicated above, GCP claims to address the educational needs of the gifted, yet it is often difficult to achieve consensus as to what exactly these needs are, as the status definition itself does not provide a clear vision of education. In contrast, TDP is more goal-driven, rather than status-based, and thus educational goals are clearer as to what line of talent development is appropriate given the manifest strengths and interests. There are two ways or strategies by which talent development goals can be fashioned, reactively and proactively. Reactively, educational goals can be fashioned based on students' demonstrated patterns of strengths and interests. This strategy is common in guidance and counseling settings as well as classrooms where differentiated teaching is practiced (Tomlinson, 2008). Proactively, talent development is promoted by deliberately organizing activities that can facilitate the emergence of interests and demonstration of high potential in particular areas (e.g., Type 1 activities in the Schoolwide Enrichment Model; Renzulli & Reis, 1997). The proactive strategy also means that priorities are set up by educators to promote a particular form of excellence (a math competition, a science project, a particular form of artistic creativity) in an age-appropriate manner so that for a particular age group, promotion of scientific talent and interest becomes more viable than, say, creative writing given our knowledge of the onset and stages of talent development in science (Simonton, 2005; Subotnik et al., 2011). Selective schools that are specialized in arts, science, and social studies or that deliberately mix science, humanities, and art also reflect the proactive strategy. In addition to providing clearer goals, such schools allow curriculum to be better defined and implemented in terms of how to make the curriculum path match the precocious and advanced development of individuals or a group of individuals (VanTassel-Baska, 2005). As highlighted by Torrance (1970) and Renzulli (1986), a pedagogy of active, critical, and creative learning is featured prominently in TDP, as the goal of talent development is to facilitate creative productivity rather than mere schoolhouse excellence (i.e., good test performance). Assessment of progress and outcomes is also facilitated by the specificity of curricular goals, the level of excellence talented students are capable of, and the kind of authentic work in which they are engaged.

Better communication and coordination with the larger education system. Instead of being insulated from general education based on a separate identity of giftedness and gifted education based on the categorical approach, under TDP, talent development opportunities are available, centered on merit-based selection systems or through self-selection. Moreover, communication and coordination with general

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education are made easier (surely engendering less resentment from outside as well). Administratively, under TDP, there is no single delivery model (e.g., self-contained or pull-out programs); rather, education for talent development and creativity consists of a continuity of educational provisions and services that present a pyramid of opportunities to students, which is easier to incorporate into the existing education system (Renzulli & Dai, 2003).

It is meaningful to juxtapose TDP with another emerging paradigm: the Differentiation Paradigm (DP; Dai, 2011; Dai & Chen, 2013). More than 30 years ago, Borland (1989) identified two modes of gifted education: a special-education approach, and a national-resource approach. Eyre (2009) named the two differently: a gifted-cohort approach and a human-capital approach. DP inherits the legacy of GCP in its emphasis on serving “special needs” and optimal match with “gifted” characteristics, but with more detailed understandings of how to adapt curriculum and instruction to suit education-relevant individual characteristics and developmental changes. In contrast, TDP inherits the legacy of the GCP in its emphasis on developing future leaders, inventors and creators on various fronts of human endeavor, but with a more pluralistic, dynamic, and developmental outlook regarding the nature of human potential and consequently the role of environment and motivation (Subotnik et al., 2011).

In terms of scope and vision, DP is a more circumscribed, present-focused, classroom-based, practice-driven model, and TDP is a broader, more ambitious (i.e., not confined to school structures and provisions), future-oriented, theory-based framework that has been implemented in many ways at the practical level. It should be pointed out that DP is not incompatible with the TDP. In principle, the strength-based differentiated curriculum and instruction advocated by DP is consistent with the goal of matching talent development opportunities with identified strengths and interests espoused by TDP. DP also has a distinct advantage of being well situated in academic activities in the classroom and focusing the present manifest needs rather than some remote aspirations. However, the “special needs” argument or special-education approach can easily lose sight of excellence as the major impetus of gifted education, and thus is not adequate as a vision of gifted education. For example, under the Differentiation Paradigm, the primary education strategy is to capture students’ “*characteristic adaptations*” in term of abilities, interests, and preferences. While the Talent Development approach also endorses this kind of “differentiation,” it further emphasizes “*maximal adaptations*” by emphasizing sustained effort and authentic tasks (not just good schoolwork), modeled after the professional world in a particular line of work. It lifts often a practical matter of deciding what to do if there is a mismatch between the curriculum offered and what one is capable of doing or interested in, to a theoretical height of producing an optimal developmental trajectory for a fledgling talent. Being responsive to characteristic adaptations (the reactive strategy mentioned above, to harness a particular pattern of abilities, interests, and styles vis-à-vis instructional environments; Tomlinson, 2008) is clearly relevant and important. However, promoting maximal adaptations and strivings for excellence in

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a socially and personally meaningful manner (i.e., the proactive strategy) is essential for educational productivity (Dai, 2014).

CONCLUSION

Over a decade ago, Borland (2003) challenged scholars, researchers, and practitioners in the field of gifted education to rethink gifted education. He argued for “gifted education without gifted children,” that is, attempting to better serve all students, gifted and talented included, providing each of them with an appropriate education without having to label some “gifted” or setting up programs for the “gifted” defined by rigid IQ or achievement criteria. In effect, he argued against what I call in this chapter the status definition of giftedness and the categorical approach.

Some may argue that gifted children exist with or without gifted programs. I can readily accept that; Joseph Bates, who was referred to as Julian Stanley, was clearly a mathematically gifted student, just as Sarah Chiang was clearly musically talented at a very young age. I would go even further to argue that natural endowment plays a big part in what they were at the time and what they would eventually become. Whether gifted children exist or not is not the point. The point is that the categorical approach excludes too many people who otherwise can participate in advanced learning and talent development. Think of William Shockley and Luis Alvarez, who did not make the cut in terms of IQ in Terman’s study but went ahead to win Nobel Prizes in physics in 1956 and 1968, respectively. The impetus of the Talent Development Paradigm is to make it possible for more people to participate in the cultivation of their strengths, talents, and interests, knowing that there are many domains and many ways in which talent and creative productivity can be cultivated; indeed we now know more about how it can be done, and we have more resources at our disposal and more tools in our toolbox than we did 100 years ago. If we still confine ourselves to the comfort zone of the status quo in the name of serving the special needs of the narrowly defined gifted, we will miss the historical opportunity to have a major impact on the 21st century, through a pyramid of educational opportunities that can accommodate a variety of talent trajectories and pathways, thereby helping produce a new generation of the *creative class* (Florida, 2002).

Granted, the choice is tough, and a paradigm shift would be not easy, as it means changing our dearly held beliefs and some of the institutionalized practices, as well as working more closely with all educators who are fighting the one-size-fits-all curriculum and the factory model of education. But the payoff also would be great, as gifted education would be repositioned to the frontier of 21st-century education rather than being completely marginalized in the new century.

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4. HUMAN NATURE

The Unpredictable Variable in Engineering the Future

We like to be in control and often do our best trying to predict everything from economic trajectories, suitability for jobs, or what next year's fashion will be. Forecasting what is to be, however, is complicated and, if involving *Homo Sapiens*, it often falls short because we only tend to acknowledge, in part, how our own species functions. Particularly in education and in mainstream psychology the study and application of research-generated knowledge has focused on individual behavior typical of the Western World, while our species' similarities to other animal species and insects have been largely overlooked or ignored. This chapter explores and defines human nature as our inevitable and evolutionary legacy; a crucial understanding as we envision, and increasingly promote, a gifted population destined to resolve macroproblems and to take on the macro-opportunities arising as world leaders and markets globally engineer the future of humanity. While gifted individuals may have critical knowledge and insight fit for benign World development, it is not self-evident that they will be allowed to participate or be listened to. We are not entirely masters of our own fate to the extent that we often imagine we are. Fact, wisdom, experience, and compassionate concerns, generally have limited value in a world governed by human nature making the problem space within which gifted individuals will be permitted to function limited.

Know thyself!—an ancient and often cited Greek aphorism. In modern times the ability to do so has even been established as a universal human capacity (Gardner, 1983; Goleman, 1995; Mayer, Salovey, & Caruso, 2004). However, how knowledgeable are we about ourselves? Human behavior has been systematically studied for quite some time, but researchers have chosen to focus mainly on individual behavior rather than studying *all* aspects of human behavior. This choice has cultural origins and has resulted in a relatively narrow understanding of behavior. In much of the Western World, for example, the content and structure of self has little in common with how self is construed in much of the Eastern World (e.g., Markus & Kitayama, 1991). Not surprisingly, scholars from cultures outside of North America and Europe have called for study and theory of behavior sensitive to, and reflecting, their own cultural settings to compensate for the apparent shortcomings of Western research (see Persson, 2012, for an overview of this critique; also Hamm, 2005; Harris Bond, 1986; Howitt & Owusu-Bempah, 1994; Kim, Park, & Park, 2000; Nisbett, 2003).

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While abundant knowledge of how we differ from one another has nevertheless been generated by Western psychology, its preoccupation with the individual has made us largely overlook the study of how we are all also similar and behave together by virtue of being members of the same species. In addition, the canons of science itself have been strongly influenced by Western gatekeepers and partisans of varying creeds; all with a vested interest in the scientific endeavor. These have decided whether research endeavors and their results, for a variety of *subjective* reasons, are acceptable or not (Ambrose & Sternberg, 2012; Bauer, 2012; Biagioli, 1993; Boghossian, 2007; Bourdieu, 1990; Brooks, 2012; Quinn, 2004).

To view humankind as an animal species with behaviors and developmental trajectories similar to those of other animals and insects, caused controversy and resentment as famed Harvard university biologist Edward O. Wilson lay the foundations for Sociobiology in the 1970s, which, then was a new field of study assuming a biological basis for *all* social behavior, including human behavior (Segerstråle, 2000; see also Herrnstein Smith, 2005). To increase our chances of resolving the World's macroproblems and taking sensible advantage of emerging macro-opportunities—the important focus of this volume—seeking to understand human behavior, well aware of cultural variations, the pitfalls of dogmatism, and focusing on both differences and commonalities including how we compare to other animals, is a necessity. In the quest to understand who we actually are as one evolving species among others, *consilience* is inevitable; that is, the convergence of evidence from independent academic disciplines—to seek to understand and study *all* aspects of human behavior by knowledge synthesis. Such an endeavor entails, apart from crossing disciplinary boundaries, also accepting multiple methodologies by which to collect and analyze data. The continued rivalry and epistemological contention between philosophical schools of thought and qualitative and quantitative study must be avoided. All serve the higher-order purpose of seeking to understand related research problems, each providing answers to different questions. *Together* they yield richness of information, help avoid reification of results, and result in a fuller, more sustainable, and valid understanding of the phenomena under scrutiny (e.g., Goutham & Couwger, 2001; Morgan, 2007; Sale, Lohfeld, & Brazil, 2002). “A united system of knowledge,” Wilson (1998) concluded in addressing the importance of consilience, “is the surest means of identifying still unexplored domains of reality. It provides a clear map of what is known and it frames the most productive questions for future inquiry (p. 333).”

As a consequence of consilience every scientist with an interest in human behavior, existence, and prospects, irrespective of chosen academic field or focus, also will have to consult the knowledge bases and experience of scholars from disciplines and cultures other than their own. Anthropologists, sociologists, economists, political scientists, biologists, geographers, psychologists, zoologists, physiologists, educators, philosophers, and so on, have all studied different aspects of human existence: from evolutionary origins, the dietary habits of hunter-gatherers, migration, the structure and nature of knowledge, habitat design, and

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artistic expression, to relationships, crowd behavior, the heritability of human abilities, trends of fashion, conflicts, child rearing, the significance of symbols, career patterns, marketing, politics, corruption, and inter-species symbiosis, to mention only a few of a vast number of fields of pursuit; all adding to the very complex picture of who and what a human being is and does. This extensive and multi-faceted knowledge base of human activity and ambition needs synthesizing if we are to grasp the nature of human existence, the social world we live in, and why society is developing in a certain direction but not in another, or indeed fails to develop as expected. In other words, understanding *human nature* is paramount to any effort of understanding political, economic, social, cultural, and individual development and dynamics. The fact that academic disciplines have often existed in splendid isolation from each another for so long, not infrequently monopolizing their knowledge as unique and exclusive to their own field of pursuit, is—in the words of Herbert Gintis (2007)—nothing short of scandalous. One commendable effort of trying to resolve this problem of disciplinary isolation and encourage more eclectic research is former Director of the National Science Foundation Subra Suresh's initiative INSPIRE (Integrated NSF Support promoting Interdisciplinary Research and Education) aimed at bringing the importance of interdisciplinary research into focus. This endeavor is merely a start. It needs to become a worldwide ambition.

WHAT IS HUMAN NATURE?

Be it systematically observed, imagined, or wished for, everything that makes humanity unique has intrigued philosophers from both the Eastern and the Western World for a very long time (e.g., Palmer, 1999). With the advent of modern science and the study of individual differences, human nature, foremost in psychology and education, became more or less understood as constituted by individual sets of general and largely culture-free cognitive processes, abilities, traits, and states. In spite of a tremendous research effort, however, human nature understood only in this way has increasingly become a problem. No matter how stringent and well considered the construction of tests purported to measure the degree of a certain personal feature, the predictability of measured behavior, no matter which feature is measured, remains surprisingly limited (e.g., Barrick & Mount, 1991; Chamorro-Premuzic & Furnham, 2003; Salgado et al., 2003). Furnham (2005) offers several possible explanations for this, all of which suggest that we have failed at some point to understand either the targeted behavior or how to measure and operationalize constructs. It would appear that something important in our understanding of human behavior, more fundamental than a certain type of, for example, a personality structure, is conspicuously missing and unaccounted for in much of current theory and practice. Perhaps, as Norenzayan and Heine (2005) concluded, “psychologists have not been studying human nature—they have been investigating the nature of educated, middle-class, young adult Westerners ... This sampling issue is especially problematic given that Western middle-class populations

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from which most psychology samples are derived, far from being typical of the world, happen to represent a cultural anomaly in that they are unusually individualistic, affluent, secular, low context, analytic, and self-enhancing with respect to the rest of the world” (p. 765). The missing piece of the puzzle is most likely a universal human capacity to respond differently to cultural contexts (Buss, 2001). To understand the capacity to adapt and change, we need to compare human behavioral attributes to other species and their known evolutionary trajectory (Tooby & Cosmides, 1989; Eibl-Eibesfeldt, 1989; Fernández-Armesto, 2005).

While humans everywhere share a number of behaviors, the differences in behavior between cultures are likely to be caused by epigenetic rules, universal in nature, triggered by differences in the environment (Brown, 1991; Buss, 2001; Wilson, 1998). To speak of personality in a traditional sense may be appropriate only to a degree and in a certain cultural context. Any understanding of the human mind also needs to be forged together with the universal and species-specific behavior that all humans currently share because of the human evolutionary past. The Big Five personality dimensions are generally regarded as partly universal and therefore descriptive of all humans irrespective of culture and, in fact, also of animals other than humans (Bouchard & Loehlin, 2001; Gosling & John, 1999; McCrae & Costa, 1997; Tooby & Cosmides, 1990). Recent research, however, has shown that human characteristics typically account for heritability at 30–60% across psychological traits meaning that 40–70% of the variance, depending on which trait, is *not* genetic in origin (Plomin, DeFries, Knopik, & Neiderhiser, 2013). This means that even though there is indeed a genetic component to universal behavior, there is also interaction with the surrounding world affecting the phenotype of any of these universal behaviors. Some traits are more prone to be impacted by the environment than others making the prediction of them by psychometric testing problematic at best (Chamorro-Premuzic & Furnham, 2003; Schmidt & Hunter, 1998).

If we are to comprehend *Homo Sapiens*, therefore, we need to seek an understanding of *Human Nature*, which includes understanding humans as a social and collectively oriented animal, universally characterized by self-interest, sexuality, nepotism, distinctive parental behavior, the importance of gender identity, natural competitiveness, power-seeking, awareness of social status, cooperation, complex learning, group orientation, group identification, conflict and aggression, altruism, and by an innate propensity for religious beliefs, hope, and a general but illusory conviction of a world always being just and fair (Alper, 2006; Anderson, 2014; Mezulis, Abramson, Hyde, & Hankin, 2004; Wilson, 2004; Wuketits, 2008). Note that emphasis in this universal characterization of the human animal is on *Homo Sapiens* as a *group-oriented species* and *not* as an individual-oriented species, suggesting also that collective cultures are actually closer to evolutionary functional behavior than the individualistic cultures of the Western World, which in turn suggests that the excessive Western emphasis on individual behavior is presumably dysfunctional.

Human nature is therefore reasonably defined as all aspects of human behavior, culture-specific and universal, serving the purpose of evolutionary adaptation

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for inclusive fitness by developing specific functions in, and triggered by, a social context (Tooby & Cosmides, 1989). For this reason, when studying and synthesizing all of human behavior and its *functions* in collective society, it is essential “that we are aware of the more primitive action and reaction patterns that determine our behavior, and to not pretend as if they did not exist. It is especially in the area of social behavior that we are less free to act than we generally assume” (Eibl-Eibesfeldt, 1989, p. 3). Even the knowledge that we generate as a result of this all-inclusive quest for understanding is ultimately also functional. It allows actions to be generated and adjusted for optimal adaptation to the surrounding world (Kaplan, 1992; Tooby, Cosmides, & Barrett, 2005).

The study of human collective behavior and its reasons has so far been largely within the purview of history, sociology, anthropology, and biology. Neither mainstream psychology nor American social psychology has much favored the study of the collective. In fact, Sabini (1992), in comparing the discipline to other social disciplines of study, defines social psychology as “more interested with the individual than are many of these other fields” (p. 1). The same can be said about education in both research and practice. It follows that neither have the research fields of gifted education or the study of talent, excellence or expertise. The latter has even denounced the impact of genetics on individual differentiation altogether (Ericsson, 2007; Howe, 1990; Howe, Davidson, & Sloboda, 1998). This denial is an understandable position in the light of its appeal to the ideals of individual self-determination in the Western World, which is of much less interest in the Eastern World (cf., Stewart & Bennett, 1991; Tamney, 1996). In the light of an overwhelming mass of evidence demonstrating the inevitability of genetic influence this is, beyond any reasonable doubt, an incorrect position to take (Pinker, 2002; Sternberg, 1986). The age-old question of nature or nurture has been resolved once and for all. How humans behave and develop, although in an exceedingly complex way, is *always* a matter of nature *and* nurture in combination thereby making species-specific adaptation possible for long-term survival (Plomin, De Fries, Knopik, & Neiderhiser, 2013; Plomin, Shakeshaft, McMillan, & Trzaskowski, 2014).

HOPE SPRINGS ETERNAL

Taking human nature into account becomes particularly interesting in addressing extreme human behavior such as intellectual giftedness. In no other context that I know of, does the human universal propensity for hope and maintaining a belief in a just world collide more dramatically than with the boundaries of permissive social behavior as imposed by universal human social dynamics.

“Illusions are generally useful,” Austrian neurologist and philosopher Franz M. Wuketits (2008) argued. “They may as a result of evolution, through natural selection, actually be instrumental in serving our survival” (p. 6, author’s translation). The human predilection for wanting to construe everything in as positive a manner as possible is most likely an evolutionary adaptation making us feel special and

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transcendent (Humphrey, 2011). Its opposite: a mood disorder such as depression, may not be a disorder at all but could be seen as an adaptive response to solving complex problems; that is, when events in our social context undermine our natural tendency to be hopeful (Andrews & Thomson, 2009; Nettle, 2004). No matter how impossible the objective reality and its problems are, we tend to believe in a positive resolution anyway, which in turn keeps us going about our daily lives as best we can. Hoping for the best certainly has survival value in evolutionary terms. But, hoped-for reality is in this case very different from actual reality. If scientific fact is based on an inadequate model of reality, then we also have an erroneous understanding of everyday life and its social dynamics. There is good reason for Harvard University's Stephen Pinker (2002) to exclaim that "the refusal to acknowledge human nature is like the Victorians' embarrassment about sex, only worse: it distorts our science and scholarship, our public discourse, and our day-to-day lives ... The dogma that human nature does not exist, in the face of evidence from science and common sense that it does, is ... a corrupting influence" (p. ix).

What is it then that we have chosen to largely ignore in considering the future and the role that we envision highly able individuals to play in it? Above all, and in the context of this volume, little attention, if any, has been paid to how a social context reacts to someone who deviates by far from general social norms. As discovered by Judge, Colbert, and Lilies (2004) in studying IQ levels and leadership they concluded that "... it is dysfunctional for a leader's intelligence to substantially exceed that of the group he or she leads. This suggests that group intelligence moderates the relationship between leader intelligence and leader effectiveness ... group members simply do not like leaders whose intellect far exceeds their own" (p. 549). After having interviewed 40 MacArthur Award winners on the nature on their life and work, Shekerjian (1990) concluded similarly, that "an unfortunate aspect of creative work is that it requires an element of risk-taking ... [and] ... society shuns its heretics" (pp. 16–17). Also, not only authoritarian regimes fear influential dissidents, political parties in democratic societies are equally sensitive to dissidence. In quite a Machiavellian style anyone who breaks ranks in a political party, religion, association, organization, institution, group, or school of thought, are usually first warned, then more or less ostracized, and finally excluded altogether unless the rogue members make amends and return to submission by conforming to the socially cohesive norms convincingly (Alford & Hibbing, 2004; Boyd & Richerson, 1992; Fehr, Fischbacher, & Gächter, 2002). Norms differ between groups. That which is acceptable in one might not be as easily acceptable in another. Even with varying levels of acceptance and tolerance there will always exist a breaking point. To differ too much from the rest in a group is rarely acceptable in any culture or subculture. The ones who did, even thousands of years ago, as far as we can tell from the anthropological evidence, were ridiculed, taunted, warned, marginalized, punished—and in extreme cases—even terminated once and for all (Shultziner, Stevens, Stevens et al., 2010). Note that this is true also of other primates. Nishida and his fellow researchers (1995) discovered that chimpanzees collectively would

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punish what they perceived as “ill-mannered members” of the group. The same may also apply to spider monkeys (Valero, Shaffner, Vick, et al., 2006).

Extreme behavior or any extreme difference in comparison to the reference group is only permissible for as long as it does not threaten group cohesion. Exceeding norms and usually tacit social boundaries will invariably trigger a negative response and lead to suspicion, avoidance, marginalization, social exclusion, and stigmatization (Crocker & Quinn, 2003). At times extreme deviation may also enhance cohesion, such as is often the case with sports achievements. National fervor is rarely more pronounced than during international competitions leading to largely unaware and even fascistoid behavior as we praise the physical prowess of the champions and show certain contempt for the weakness of the vanquished (Tännsjö, 1998). We identify with athletes' success and distance ourselves from their failures (Cialdini, Borden, Thorne et al., 1976; Snyder, Lassegard, & Foster, 1986). In order to stay part of a group there exist basic needs for similarity, identification, confirmation, and communication. Being able to communicate intelligibly and effectively is what makes any species able to collaborate, aware or unaware, for long-term survival (D'Ettorre & Hughes, 2008). This is where intellectually gifted individuals often fail if having to relate to any group of unequal intellectual stature and comprehension (Hollingsworth, 1942; Persson, 2009).

Inequality in terms of welfare and possessions also affects social cohesion (Apicella, Azevedo, Christakis, & Fowler, 2014). Inequality has many dimensions but several are related to the distribution of wealth. The more uneven the distribution the more frequent the crime and violence rates in a society. Similarity between groups disappears (cf. Shapiro, 2009). They can no longer identify with one another, communication breaks down, and it becomes impossible to confirm and reconfirm status and belonging in the transforming social structure. In addition, citizens' physical and mental health deteriorates (Wilkinson & Pickett, 2009; Charvet, 2013). Cohesion dissipates until a point of no return is reached and the differences between groups in society become too great. This is likely to trigger a violent reaction aiming at returning society to an acceptable balance of distribution (Nafziger & Auvinen, 2002). Differences in wealth distribution are an important factor, but wealth is not the only factor in triggering social upheaval (Cramer, 2005). Hence, social cohesion is fundamental to human existence and survival.

Homo Sapiens, like other animals, are alarmed by differences and soothed by similarities, familiarities, and equalities! It is not a coincidence that gifted children in school often try to hide their giftedness (Foust, Rudasill, & Callahan, 2006). Like every other member of the human species, on the whole, they too wish to be like everyone else, or that everyone else should be like they are.

THE FUTURE: WHERE NO ONE HAS TRAVELED BEFORE

As magnificently demonstrated by Ambrose in this volume (chapter 2), humanity faces both formidable challenges and opportunities by developing into a global

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community of transnational interdependence through a global knowledge economy. A few of the skills, dispositions, and areas of knowledge needing particular attention in dealing with arising macroproblems and macro-opportunities, as suggested by Ambrose, are broad and deep proficiency in subject areas, critical and creative thinking skills and inquiry-based dispositions, interdisciplinary thinking, visuospatial literacy, information-technology skills, a flair for all things related to economy and business, interpersonal self-discovery and sense of purpose, cognitive diversity, interpersonal ability, collaborative skill, leadership ability, ethical insight, global and multicultural awareness, and personal and social responsibility. Beyond doubt, Ambrose's observation is, by and large, probably correct given that we, to some degree, know how the future will unfold. But are we indeed in a position to predict and engineer our own future?

In recent decades, technological and economic development have grown and flourished beyond comparison in human history, but it is also true that the human track record of decisions taken by a few for the "the greater good" of the many unfortunately leaves limited hope that the future might turn out more brightly than our past (see Armstrong, 2014; Bales, Trodd, & Williamson, 2009; Fone, 2000; Kiernan, 2009; Orr, 2014; Sarna, 2010). The reason for a perhaps misplaced hope in a bright future and in a prosperous and peaceful world, is that we usually ignore, or fail to transcend, the reality of human nature, which in turn generates the illusion of hope to keep us evolving with reasonable success as a species. In spite of the wealth of human achievements having transformed the world completely, our genetic blueprint for basic social behavior has *not* discernibly changed for a very long time (Voland, 2007).

A case in point is how scientific efforts have made it possible, in a normal population, to considerably enhance cognition, mood, physical abilities, and even to extend life itself. For this reason and others, it has been argued by a few that human evolution has ceased altogether or at the very least taken an entirely different direction (see Kanazawa, 2008; National Research Council, 2009). Savulescu, Meulen, and Kahane (2011); however, argue that while human enhancement research has developed tremendously in a short time, moral and ethic enhancements have not followed. These have been neglected as scientists, markets, and societal leaders, who revel somewhat in the achievements, discoveries, and technological prowess of the current era. "We are at the level of infants in moral responsibility, but with the technological capabilities of adults," Nick Bostrom, Head of Oxford University's Future of Humanity Institute argued in an interview by the BBC: "the advance of technology has overtaken our capacity to control possible consequences" (in Coughlan, 2013). "Even if human beings were psychologically and morally fit for life in those natural conditions in which they have lived during most of human history", Persson and Savulescu (2011) reflected also, "humans have now so radically affected their conditions of living that they might be less psychologically and morally fit for life in this new environment which they have created for themselves" (p. 486). It appears indeed that the

current era of emphasis on technological and economic growth is undermining our collective human nature and also our much needed sense of belonging to an identifiable group. Verhaeghe (2014) explains that anyone who fails to “succeed” in our day and time also tends to believe that there is something wrong with them. The cult of success in a knowledge economy generates pressure to also achieve and be happy. This is resulting in disorientation, a distorted view of the self, and for an increasing number of people, despair, as Verhaeghe sees it. The globalized economy, argued to generate prosperity for all, has so far made people lonelier than ever before.

Morality and ethics are values. As such they too, by necessity, must serve an evolutionary function. Evolution is a force of development characterized by chance and probability, not by good or evil considerations. Prosocial behavior serves several purposes but is generally useful only when, in one way or another, it achieves something beneficial for the group to which the moral behavior applies. In this light, the staggering current development of particularly artificial intelligence (AI) needs to be understood. It is a development that, if not causing the “quantum leap” in human progress of which Ambrose writes earlier in this volume, it will certainly be instrumental in achieving it. This is a development feared by an increasing number of insightful scholars. They too see the advantages that an AI break-through potentially could bring, but they are simultaneously wary of human nature considering it unreliable and largely unpredictable (e.g., Bostrom & Cirkovic, 2011).

There is competition amongst research groups to be the first to arrive at an AI-system that could compare to, and is indeed also expected to exceed, human intelligence, problem solving, and decision making. To get ahead in the race, motivated by the allure of gain and recognition in being the first to reach the goal, safety precautions are sometimes ignored or simply forgotten. They are too time consuming to consider, too complex, and therefore possibly too expensive to take seriously (Armstrong, 2014; Armstrong, Bostrom, & Shulman, 2013; Waluszewski, 2013). The central feature of AI risk is this: Unless an artificial intelligence is specifically programmed to preserve what humans value, it may in fact destroy those values—and humanity with it—*by accident* (Muelhauser & Salamon, 2013). One eye-opening example of how lightweight the ethics and morals of some individuals might be if presented with the prospects of considerable personal gain, given that there is no perceived negative consequence attached to the means by which that gain will be procured, was elegantly demonstrated by market researchers James Patterson and Peter Kim (1991). In a study receiving considerable attention by the media at the time, they found, for example, that if receiving the sum of \$10 million U.S. dollars 25% of the 2000 well-sampled American participants would abandon family, 10% would withhold testimony and allow a murderer to go free, 7% would kill a stranger, and 3% would even sell their own children. As astounding as these results were it is of some comfort that the majority of participants certainly upheld the moral standards typical of their culture. They were not swayed by the promise of personal gain at the expense of other fellow human beings.

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INTELLECTUALLY GIFTED HEROES TO THE RESCUE

The fact that we often choose to ignore the existence of human nature and the boundaries it imposes on social behavior has prompted many to see the gifted as tomorrow's leaders and problem solvers in facing the world's macroproblems (e.g., Sever, 2011; Shavinina, 2009). In addition, they are increasingly construed and discussed in economic terms to make their uniqueness more appealing to political leaders and markets as effective human capital, with a potential to deliver untold feats of creativity and innovation for maximum profit at minimum cost controlled in quality-managed employment in both national and global economies (Persson, 2015). We also hope that they will seek and succeed in finding the macro-opportunities emerging as the future unfolds on the basis of a growing global economy—for their sake and ours. But importantly, we simultaneously tend to overlook the fact that individuals who are perceived as being very different in comparison to the normal population are often also unlikely to reach positions of public trust, influence, and leadership (Simonton, 1994; Tannenbaum, 1993).

I argue that the construal of seeing intellectually gifted individuals in particular as exceedingly effective human capital as well as macroproblem solvers is, to a degree, false. Such manner of reasoning is likely to be influenced by our adaptive proclivity for illusory hope serving as a type of defense mechanism. The realization of an uncertain and potentially grim future is difficult, if not impossible, for most of us to accept. Perhaps somewhat paradoxically, in spite of this, I also argue that the intellectually gifted population does nevertheless constitute our best hope to procure humanity's welfare by exposing or avoiding irresponsible management, crooked business, and forced development of, for example, synthetic biology, nanotechnology, genetic manipulation, and artificial intelligence in its many shapes and forms (Bostrom & Cirkovic, 2011). Given that the knowledge we have of human individual differences as applied to the intellectually gifted is to some degree correct, then this population is indeed a compassionate one with profound insight and novel ways of approaching problems and obstacles. They are intellectual, social, and in most cases exceedingly ethical. I therefore propose, by observation and experience rather than by empirical evidence, that the intellectually gifted often have the ability to at least in part transcend the imposing forces of evolutionary human nature, and make an intentional choice to act contrary to it. Deviating from what most others are doing and thinking more or less unreflectively, they are uniquely able to choose to act or think independently and in accordance with their own chosen values and convictions. They also seem able to abide by their choices in facing considerable adversity even if it has severe personal consequences. There certainly exists circumstantial evidence that this is the case, which many intellectual dissidents through history, political and philosophical, are examples of (e.g., Horvath, 2005).

So, the world does indeed have potential heroes: intellectually gifted individuals able to provide the input needed to safeguard the good future of humanity to the extent that this is possible to do in view of evolutionary hardwiring. The future,

like human development, is *probabilistic* rather than deterministic. Its development is non-linear (Barton, 1994; Plomin, DeFries, Knopik, & Neiderhiser, 2013). Our freedom to choose how we develop as a species is, therefore, more limited than we would like it to be. We appear even to be, to some degree, predisposed for our political leanings (Kanal, Feilden, & Firth, 2011). While we as a species develop and change our habitat with great speed and cunning, we do so not so much as logical master builders but perhaps more often as involuntary but quirky servants of inherited human nature. We cannot avoid this due to evolutionary programming. But we can certainly have a degree of positive and constructive impact if we also learn to understand human nature (Bostrom, 2013; Diamond, 1992). Herein, I think, lies our hope for the future. The probabilistic problem space of human existence, its development, and human ambition, is where the intellectually gifted certainly may contribute significantly to global human welfare and make a difference.

But this development is likely to hinge on the fact that we remain aware that intellectual giftedness constitutes extreme behavior and represents only a small percentage of a normal population. The more gifted someone is the more she or he stands out in comparison to a majority of people. The intellectually gifted are not like everyone else and this invariably comes with a difficult challenge (Hollingworth, 1942; Fiedler, 1999). In order to contribute to society with everything that they potentially have to offer they must first be recognized, accepted, and given a mandate to act. In Joan Freeman's (2005) words: "It takes permission to be gifted" (p. 80). In synthesizing the often neglected research into the more difficult aspects of being gifted, Fiedler (1999) importantly observes that "along with the promise of potential come the problems of potential—problems that are often a direct effect of differing from the norm in ways that others are not necessarily prepared to deal with" (p. 434).

We like to be in control of all things, but the idea that we always are is almost certainly an illusion prompted by evolution. There certainly are limits to what can be achieved even though this is not something we like to admit. We may be able to positively influence, above all, local situations involving only few individuals. But the larger the group the more difficult it will become to influence and decide a direction for the larger group to take (see the latest report of the world Watch Institute: Orr, 2014). The ongoing global climate war is but one example in which the political will is pitted against the interests of the markets, mediated by scientists, and all are in turn pitted against the boundaries of Nature itself (Mann, 2013). Clearly, there are several gifted individuals involved in advising world leaders what to do and how, in a sincere effort to support sustainable world development. But it is a considerable challenge for them to be heard and taken seriously for a variety of reasons (e.g., Sample, 2014; Shaw, 2015). Fact and insight, contrary to ideology or ambitions for power and superiority, are not always valid arguments in a political reality for decisive action on behalf of everyone; or phrased differently: fact and insight sometimes have limited value in a world entirely governed by human nature.

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In conclusion, we must learn to count on acting and planning with taking human nature into account. While this would, to a degree, change our ambitions, it would also make our efforts more realistic and therefore also more effective in searching for, and claiming, future macro-opportunities.

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5. THE ROLE OF DOMAINS IN THE CONCEPTUALIZATION OF TALENT

In this chapter we present research concerning important aspects of domain specific giftedness. Specifically, we address the evidence regarding the relationship between specific abilities and achievement. Empirical evidence suggests that specific abilities have been used widely and validly for identification of exceptional talent in performance domains, and mathematical and spatial reasoning ability have demonstrated predictive validity for achievement in STEM domains. We note that domains of talent have unique trajectories and discuss four critical aspects of domain specific giftedness. These include the developmental nature of giftedness (giftedness moves from potential to competency to expertise and possibly to eminence over time); the temporal nature of giftedness (that domains vary in their starting, peak and ending points); the contextual aspect of giftedness (societal value of some domains over others, changing of domains and emergence of new domains, and the environmental influences in fostering domain specific achievement); and the relative nature of giftedness (childhood giftedness is advancement relative to age peers while adult giftedness is exceptional achievement relative to other domain experts). Finally, we present some implications of a domain perspective on giftedness for educational practice.

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In the 1980s, Csikszentmihalyi proposed what has come to be known as a systems theory of creativity. He recognized that creativity does not occur within a vacuum but results from an interaction among a person, a domain, and a field. Domains, such as the performing arts, the sciences, humanities and sports, have their own symbol systems, content, and structure. Individuals make creative products or ideas within domains and being able to do so rests on having a great deal of domain specific knowledge. A physicist must know physics; a surgeon must know anatomy, physiology, and the techniques of surgery. Csikszentmihalyi and Robinson (1986, p. 278) defined a domain as “a culturally structured pattern of opportunities for action, requiring a distinctive set of sensorimotor and cognitive skills—in short, a symbolic system such as music, mathematics, or athletics.”

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The social organization of a domain is referred to as the field and includes those people who can alter and affect the structure and knowledge base of the field—the statuses relevant to the domain and the roles of people within the domain (Csikszentmihalyi & Robinson, 1986). In chemistry, for example, this includes scientists, journal editors, grant reviewers, funding agencies, and chemistry teachers. In theater, it includes actors, producers, choreographers, playwrights, critics, and drama teachers. For a product or idea to be considered creative, it must be judged to be so by the gatekeepers within the field. The creator must strike a balance between offering a variation on the domain that is different enough to be considered novel, yet recognizable as belonging within the domain. Over time, if well received, the new knowledge becomes part of the accepted content of the domain. It is through this evolutionary process that the best new knowledge and ideas *survive* to change and alter domains and move fields forward (Csikszentmihalyi & Robinson).

The Relationship between Abilities and Domains

Theoretical perspectives. The recognition of the role of domain specific abilities to talent development is echoed in the conceptual frameworks of a number of leading theorists. Renzulli (2005) added specific abilities to his triad enrichment model of giftedness along with the core concepts of general cognitive ability, creative ability, and task commitment. Tannenbaum (1983, 2003) argued that fulfillment of potential in all domains requires some degree of general intellectual ability, although the level of general and domain specific abilities and the constellation of psychosocial skills, external support, and chance opportunities vary by domain. In Gagne's (2005) differentiated model of giftedness and talent, multiple natural abilities including intellectual, creative, socio-affective and sensori-motor abilities map to expertise in various talent domains and are essential along with environmental and intra and interpersonal catalysts for giftedness to develop into talent.

Sternberg (1998, 2001, 2003), in his wisdom, intelligence, creativity synthesized (WICS) model proposed that three key abilities—analytical intelligence, practical intelligence and creative ability—are important to success although the balance of these may vary depending on the requirements of a field or career. The Talent Search model, developed by Julian Stanley (1976), has above-grade level, domain specific testing as a fundamental component. Subsequent longitudinal research on talent search participants (e.g., Park, Lubinski, & Benbow, 2007) has substantiated the predictive validity of specific abilities such as verbal, mathematical and spatial reasoning ability measured in early adolescence for adult achievements in related domains (see below).

Research on the role of domain specific abilities. An important question for our field to address is the relationship between abilities and achievement within domains. Does ability matter and if so, is the greater contribution from general ability or specific abilities? If specific abilities, which ones and for which domains?

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Unfortunately, we do not have definitive research evidence on all of these questions. However, we do have research to support the following related points:

- General cognitive ability, IQ, has predictive validity for school achievement, job performance, and general life outcomes (Neisser et al., 1996; Nisbett et al., 2012), although it is still not clear how IQ relates to creative productive achievements in adulthood.
- Great variability in specific abilities emerge as high IQ children develop, such that this variability is measureable by adolescence (Gottfredson, 2003).
- Research shows that domain specific abilities—that is, mathematical or verbal ability (Lubinski, Benbow, Webb, & Bleske-Rechek, 2006; Park et al., 2007, 2008; Wai, Lubinski, & Benbow, 2005)—predict school performance *and* adult achievements including creative and scholarly accomplishments in related domains. Specifically, tilt in cognitive profiles (e.g. higher mathematical abilities than verbal abilities) is related to achievement in STEM domains and vice versa. Spatial ability is important for domains such as physics and engineering, in addition to strong mathematical reasoning ability (Wai et al., 2009).
- There is no upper threshold for specific academic abilities; higher levels are associated with higher adult accomplishment. Wai et al. (2005) found that individuals who were in the top 1% in terms of mathematical ability did well academically, and yet their *rank* within the top 1% of ability in mathematics, as measured by standardized tests, predicted differential academic success. Further, participants in the *highest quartile of the top 1%* (a) obtained more doctorates, (b) earned more income, (c) produced more patents, and (d) were more likely to be awarded tenure at top universities than participants in the lowest quartile of the top 1%.
- There are some domains in which the role of specific skills has been studied extensively. For example, there is a substantial literature on the contributions of phonological skills to reading achievement in the elementary grades (e.g., Badian, 2001; Cormier & Dea, 1997; Margolese & Kline, 1999; Shatil & Share, 2003; Zifcak, 1981), although reading comprehension in adolescence may be better predicted by *g* (Hulslander, Olson, Willcutt, & Wadsworth, 2010).
- Use of specific skills is common in many performance domains (e.g., performing arts, sport) and magnify the contributions of abilities. Choreographer Eliot Feld, based on years of experience building dance troupes and educating novice dance stars, identifies potential dancers around the age of 8. His auditions seek indicators of flexibility, body proportion, and physical memory (Subotnik, 2002). In field hockey, researchers (e.g., Elferink-Gemser, Kannekens, Lyons, Tromp, & Visscher, 2010; Elferink-Gemser, Visscher, Lemmink, & Mulder, 2007) found that elite and sub-elite players had better technical and tactical skills than non-elite players, and elite players also had better procedural skills than sub-elite players. A few domain-specific characteristics have also been associated with musical performance in several studies, including pitch perception (Freeman, 2000) and

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audiation (Ruthsatz, Detterman, Griscom, & Cirullo, 2008), and voice teachers identified intonation, timbre, musicality, and ability to control pitch as important factors related to singing talent (Watts, Barnes-Burroughs, Andrianopoulos, & Carr, 2003).

- Research on prodigies indicates that children can simultaneously reach levels of expertise typically only displayed by adults in some fields including mathematics, chess and music, while being at age-appropriate levels in other areas. This finding suggests that domain specific abilities can be developed to a high level “without bringing all of cognitive development with it” (Feldman, 1986; Morelock & Feldman, 2003).

There is not yet general agreement on the exact nature of specific abilities (e.g., whether these can be taught), nor their importance in predicting eminence and creative accomplishments, and we propose a direction forward in this article. Some experts (e.g., Gottfredson, 2003) conclude from their reviews of the literature that measures of specific abilities such as verbal, spatial or mathematical ability add little to the prediction of achievement beyond measures of general intellectual ability and are related to achievement only because of their *g* loading. Others argue that the literature provides support for the importance of both general cognitive and domain-specific abilities (e.g., Dai, 2010). The research on talent development also clearly indicates that domain specific abilities are necessary but not sufficient for fulfilling potential.

Domain Trajectories

Theoretical and conceptual perspectives on giftedness have long recognized the developmental, relative, contextual, and temporal nature of giftedness. These perspectives stand in contrast to approaches to gifted programming in schools, which generally treat giftedness as a fixed, permanent trait within an individual, present at birth.

The developmental nature of giftedness. In 2010, Dai proposed that giftedness should be thought of as a state that individuals works towards attaining. Csikszentmihalyi and Robinson (1986, p. 271) wrote,

The point is that, if we agree talent depends on social attributions rather than on a naturalistic trait locked in the child’s physiology, then it follows that talent should be thought of not as a stable characteristic but as a dynamic quality dependent on changes within the individual and within the environment.

Cross and Coleman (2005) suggested that earlier forms of giftedness manifest in an exceptionally rapid rate of learning and higher general cognitive ability. With time, however, the role of general cognitive ability diminishes as interests

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and abilities coalesce and individuals pick up domain specific knowledge and skills (Cross & Coleman, 2005; Dai, 2010). Talent and abilities become more differentiated with development and achievement within a domain and high motivation increasingly becomes the marker of giftedness. Subotnik, Olszewski-Kubilius, and Worrell (2011) further argued that giftedness always begins as potential for achievement. With appropriate opportunities offered and effort in the form of study and practice on the part of the individual, potential can be turned into growing competency in adolescence and domain expertise in adulthood. Beyond expertise, the highest and rarest level of giftedness is creative productivity at eminent levels in a field.

The relative nature of giftedness. We begin with the premise that “outstanding performance is almost always judged relative to others in one’s peer group” (Subotnik et al., 2011, p. 40). In K-12 education, we identify somewhere between 2% and 10% of the student population to participate in gifted education programs, depending on the district and the resources available, most often on the basis of scores on ability, achievement tests, or both. Generally, children are considered gifted by virtue of levels of performance on ability or achievement tests that are beyond those of most of their age-peers. Selection for programs can then vary based on availability of space and context, whereby someone who might be placed in a program in one district would be less sure of placement in a district with more high achieving students. In the performance areas of art or music, children are considered gifted if their drawings or performances meet benchmarks established by the domain over time, and the performances are much better than those of most others their age. Finally, the rare form of achievement—that is, being a prodigy—is demonstrated by children when their achievement is comparable to that of adult experts in a domain.

Looking beyond the pre-collegiate years, in America 74% of students who enter high school complete their diploma and about 72% of high school graduates enroll in college; however, only 30% of adults have a Bachelor’s degree (Aud, Fox, & KewalRamani, 2010). If we go beyond the bachelor’s degree, the percentages of individuals earning advanced degrees shrinks even further. According to the 2011 U.S. Census, approximately 3% of the population earns a doctoral or professional degree. All of these individuals would be considered gifted compared to the general population, but within their particular fields (e.g., medicine, dentistry, physics), they would not all merit the title of *gifted* doctor, dentist or physicist. A physicist is not considered gifted based on exceptional childhood IQ scores, high school SATs, or grades in graduate school, but by virtue of her contributions to the field of physics as judged by other physicists, critics, and gatekeepers in the field.

In sport, the arena is even more rarefied. The NFL has fewer than 2,000 players, the MLB has fewer than 1,000 players, and the NBA has fewer than 500. Again, compared to the general population, all of these athletes would be considered gifted, but how many would be considered outstanding *within* their sport? Giftedness,

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by definition, is rare and as individuals develop skills and competencies in their field, the basis for the label is relative to others who have similar levels of training in the domain and involvement or participation in the field (Worrell, Subotnik, & Olszewski-Kubilius, 2012).

The contextual nature of giftedness. Domains of talent exist within socio-cultural contexts. There is not an infinite number of valued domains. One cannot be gifted in a domain that does not yet exist, and one will not be lauded as gifted in a field that is not socially valued, even if only by a select group of individuals, although values placed on different domains may change over time. Simonton (1994, p. 73) remarked “talent will find it tough going if their gifts do not line up with the prevalent cultural patterns,” for example, being in a society that does not support the talents of some group members (e.g. minorities or females) or the range of talents of its members.

In addition, domains of talent change over time. One has only to look at the number and types of competitions added to the Olympics to see how sports domains have changed (e.g., the winter games added snowboarding; the summer games dropped baseball and softball). Csikszentmihalyi and Robinson (1986) noted that as domains change even within an individual’s lifetime, the definition of who is gifted may also shift. There has also been a tension between “high” or classical arts, and “low” or popular arts. In recent decades, the curricula in music conservatories have expanded to include the study and critique of more contemporary musical styles such as pop, rock, jazz, and hip-hop. At the same time, many of the traditional classical arts, such as orchestral music, ballet, representational painting, and sculpture, are still revered in training programs, but are not popular or as highly remunerated as more popular styles and genres.

Newly minted PhDs need to have multiple publications in order to land a first assistant professor position. Ice skaters need to include more complex jumps in their Olympic performance and swimmers need to have faster times to compete at an elite level. Standards of performance are not the only thing affected. As domains become culturally valued, opportunities for training and talent development become more widely available, particularly for younger and younger children, resulting in both greater competition and winnowing of talent at higher levels of performance.

The development of talent is contextually based and the role of the environment is crucial. Optimally, families identify and support their children’s talents, schools recognize potential and provide opportunities for their development, and communities engage students with additional, outside of school learning programs, support, and mentors. As individuals progress to higher levels of talent development, the culture of the domain exerts a socializing influence through mentors, advisors, and coaches, affecting beliefs, values and perspectives.

The temporal nature of giftedness. The process of talent development varies by type of field and domains have unique trajectories. Whether a trajectory begins in

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early childhood versus adolescence, for example, depends on when the skills and abilities in the talent area emerge and coalesce enough to allow for recognition in some reliable fashion. Thus, the trajectory is affected by physical maturation in fields such as music and sports, and it also depends on when talent can be ascertained by systematic identification procedures (e.g., testing or ratings by knowledgeable adults such as educators and coaches). For example, boy sopranos can begin to perform in the early elementary grades (see Figure 1), but adult singing voices do not develop until after puberty. Similarly, precocity in mathematics may be obvious as early as the preschool years whereas an aptitude for the social sciences may not be recognized until late high school or college. In the athletic domain, specialized training and search for stars begins in childhood for some sports (e.g., gymnastics) while flexibility is optimal, while in others (e.g., American football; Malina, 2010), more emphasis is placed on general conditioning in the early years and the emergence of stars must await the development of adult height, girth, and strength.

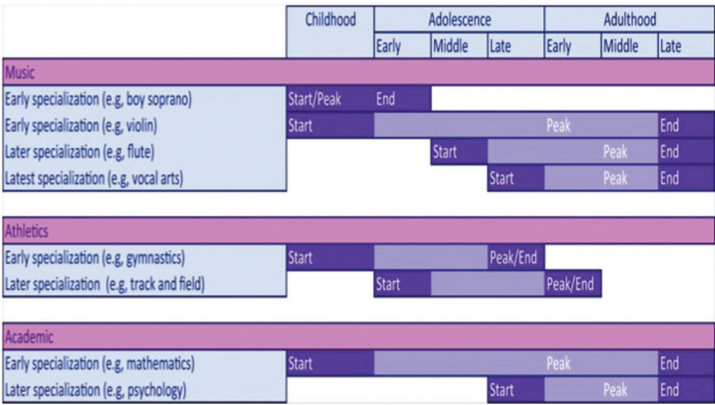


Figure 1. Trajectories for Different Talent Domains.

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End points of developmental trajectories also vary widely. Some trajectories are short, for example, puberty truncates further development in boy sopranos. For most academic fields and some musical fields, however, these developmental arcs are virtually lifelong. Fields where outstanding performance peaks in late adolescence or early adulthood, such as gymnastics, diving, and figure skating, are typically those involving particular physical skills or body types. They are affected substantially by physical changes that occur with aging. These fields also typically have short peak-to-end intervals. For many other fields, especially academic ones,

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individuals can remain involved and active well into late adulthood, with almost no limits on productivity. Intervals between starts and peaks also vary greatly, with some fields requiring long periods of preparation (e.g., most academic fields, Simonton, 1977, 1984a, 1991, 1992a, 1992b, 1997, 1998, 2007), whereas in others, major contributions can occur much earlier (e.g. mathematics).

The developmental course of domain trajectories is affected by training, educational requirements, and tradition, which are tied to our schooling system in many academic areas. For example, the serious study of social sciences such as sociology, anthropology, or psychology, typically does not start until high school or college, although it could begin earlier, especially for verbally gifted students. As a result, specialization can typically get underway only in college. Peaks are also affected by the amount of training and education needed to reach high levels of expertise (e.g., the 10,000 hour rule; Ericsson, Krampe, & Tesch-Römer, 1993). Domains such as psychology, religion, diplomacy, or literature, require the accumulation of maturity and experience to generate important contributions, and so typically occur later.

Csikszentmihalyi and Robinson (1986) characterized giftedness as a dynamic quality that is dependent upon changes within the individual and within the environment. They delineated the intersection of four major developmental sequences that affect the fruition of talent from childhood to adulthood. These include *cognitive development* from the sensori-motor stage to concrete operations or the problem solving stage to formal operations or the problem-finding stage of cognition. Simultaneously, the talented individual progresses through major *psychological and emotional shifts* from autonomy to identity to intimacy and finally, to generativity. *Progression within a domain* begins with initial dabbling to learning the cultural canon and finding a personal style. Finally, *the path within a field* moves from informal involvement to formal training and education to apprentice to a scholar or artist. These overlapping developmental timetables can result in challenging transitions that not all individuals, despite their level of talent, successfully make. For example, the cognitive and psycho-social skill involved in being a problem finder differ from those involved in being a problem solver. The introverted, loner artist must transition to being “a gregarious self-promoter who can attract the attention of the gatekeepers of the field and who can negotiate advantageous terms with gallery owners and collectors” (Csikszentmihalyi & Robinson, 1986, p. 279).

Subotnik et al. (2011) proposed a mega model to capture the progression of talent development over the lifespan and highlighted critical transition points for both performance and production domains in Figure 2 of that article. First, domains have developmental trajectories with different start, peak, and end times for outstanding performance. At the earliest stages, giftedness is determined and largely defined by potential for future exceptional achievement, whereas at the middle stages it is determined by demonstrated achievement in the form of growing skills competencies.

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With opportunity and effort, talent in adulthood manifests as domain expertise or, more rarely, creative productivity at eminent levels.

The type of creativity an individual manifests changes over time is one of the features that distinguishes ability from competence, competence from expertise, and expertise from eminence. Precursors of adult creativity may present initially as within-person variables such as independent thinking and a willingness to entertain different perspectives and views. Elementary and middle school students can be taught process skills and tools to stimulate creative thinking such as metaphorical thinking, divergent thinking, and creative problem solving (Pyryt, 1999). Transitioning to eminent levels of achievement requires a substantial shift: Creative products are judged not just in relation to others at similar levels in the field, but also by how they move the field forward (Simonton, 1977, 2000). The shift is from being an expert problem solver to being innovative in finding the most important and elegant problems to solve.

There may be different levels and kinds of motivation associated with eminent levels of achievement. What Subotnik et al. (2011) labeled “little m” motivation and Duckworth, Kirby, Tsukayama, Berstein, and Ericsson (2011) called self-control refers to the motivation involved in smaller achievement related tasks and decisions, such as which course to take, what to major in, whether to attend a summer program, and whether to try to get an A in a course. These decisions accumulate over time and thereby make it possible to reach higher levels of preparation, for example, to gain entrance into graduate school. “Big M” motivation, a term we have coined analogous to Big C creativity, refers to compelling drives, rooted in early experiences and underlying over-arching goals such as the desire for fame, fortune, power, or the desire to change the world, drives that are often at the root of the tremendous work involved in making eminent contributions and innovations (Amabile, 1996; Csikszentmihalyi, 1988; Ochse, 1990; Olszewski-Kublius, 2000; Piirto, 1998, 2004).

The talent development process is driven by expert teachers, mentors, and coaches who provide opportunities for gaining knowledge and honing skills. At each stage, the strategies and goals of instruction change (Bloom, 1985b). In the earliest stage, the primary role of the teacher is to engage the young students in a topic or domain, and to engender enthusiasm and capitalize on motivation. At the next stage of development, it is critical that teachers help the individual acquire the needed skills, knowledge, and values associated with the acquisition of expertise in that domain. The third-stage teacher helps the talented individual develop a niche in the field, a personal style, method or approach, or unique area of application.

Of course, movement from ability to eminence can be enhanced or impeded by factors such as low motivation, mindsets that prevent coping with setbacks or thwart resiliency, less than optimal learning opportunities, or chance events. On the other hand, progress can be maintained or even accelerated by the availability

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of appropriately challenging educational opportunities that include out-of-school enrichment, mentoring, and psychological and social support from significant individuals.

Subotnik et al. (2011) distinguished between performance (dance, actors, athletes, musicians) and production (academic scholars, scientists, writers, composers) domains. These domains are similar in several important respects: Outstanding achievement and performance in both categories is dependent upon high levels of domain-specific content knowledge, high levels of domain-specific skills, and psychosocial skills such as self-promotion, resiliency, controlling anxiety, and motivation; these are critical regardless of the type of domain. However, the trajectories, rewards, and influences differ. Within the performance domains, specifically music and sport, the standards for excellence are more explicit, and often there are benchmarks to gauge where an individual is along a developmental path. Additionally, judgments regarding talent are typically made by individuals who participate as performers in the domain and on the basis of demonstrations (i.e., auditions) that closely mirror actual performances. In many performance fields that involve physical grace or aesthetics, there is little room for “late bloomers” (e.g., gymnastics, figure skating).

In contrast, production domains have fewer limitations based on physical capabilities. Academic domains such as chemistry or mathematics, typically make judgments about talent via objective tests, often with little resemblance to authentic production in the domain. Also, the evaluations of individuals who witness performances and products in pre-collegiate education, that is, teachers and parents, are typically not employed (Subotnik et al., 2011). In addition, there are few academic areas that have agreed upon developmental benchmarks, making it difficult to judge progress and level of talent development, although in these fields, there is typically greater latitude for late bloomers.

Domain Specific Programming

As individuals pursue the development of their talent, critical programming must become more domain specific. In performance domains, programming is more likely to take place outside of school (dance lessons, music lessons, acting lessons) and school may only provide an introduction through extra-curricular activities or study of non-core subjects (e.g., band, orchestra, school plays, team sports). For serious study in sport and music, parents resort to community programs (e.g., club sports) or private teachers and coaches. For some academic domains, particularly mathematics, acceleration is used to accommodate a student who is capable of working well above grade level. Most schools lack concerted pathways with articulated sequences of courses for students who demonstrate early talent and exceptional interest in language arts, science or social studies. In secondary school, students can be challenged to work at a higher level and faster pace in honors and Advanced Placement (AP) classes or the International Baccalaureate

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Program (IB), but these courses typically provide exposure to more content only. Some schools may accommodate gifted students by allowing early access to AP courses.

Programming is critical at every step of the talent development pathway and as children progress, needs focus less on general academic skills and more on ones specific to the domain of talent. STEM students need opportunities to do hands-on work that is increasingly similar to the authentic experimentation of scientists and engineers. Creative writers need opportunities to hone their craft through practice and critique and by having their work read by real audiences. Programming at the secondary level should expose students to the culture of the domain via interactions with real professionals working in those areas, thereby facilitating socialization as a committed scholar to the field. Secondary teachers can facilitate access to competitions and conferences and other extra-curricular and outside of school activities where students can meet peers, interact with professionals in the field, identify future mentors and acquire tacit knowledge about educational and career paths.

An interesting and yet unresolved arena for study and discussion is the role of interdisciplinary study in creative productivity. Clearly, it is important and needed, but the question remains when is the optimal time to introduce it. For example, a playwright may need deep study of historical periods. An engineer needs to understand human factors psychology to generate designs that are attractive and useful.

Beyond Domain Knowledge

Subotnik and Jarvin (2005), based on their study of Julliard students, proposed the importance of deliberate and systematic teaching of psycho-social skills that are necessary to reach higher levels of achievement in a domain. The lack of these skills, which are typically left to chance in academic domains, can thwart the progress of individuals with high potential and ability. According to this research, psycho-social skills should be addressed in a sequence corresponding to the stage of talent development and that the importance of specific skills can vary depending upon the domain of talent.

Parents, educators, coaches and trainers are key providers of psycho-social skills training. In addition, talent development activities, whether in school or outside of school, or self-initiated, are contexts for students to acquire, practice, and hone key psychosocial skills such as emotional regulation, openness to feedback and critique, or a growth mindset. Psychosocial skills, such as motivation and persistence, resiliency and grit are the critical levers that enable talented individuals to successfully transition to a higher stage of talent development, which necessarily involves increased stress, competition and risk-taking. See Table 1 for a list inputs and important psychosocial skills at different developmental periods (e.g., moving from potential to competence).

Table 1. Critical inputs and associated psychosocial skills for each stage of talent development

Stage of talent development	Inputs	Psychosocial skills response
Transforming potential Into competence	Early exposure and playful engagement through family activities or formal/informal programs	Learning to demonstrate interest, engagement, curiosity, enthusiasm from experiences and opportunities so as to effectively engage adults in providing instruction and learning opportunities
	Reinforcement of interest and enthusiasm by parents, teachers	Growing comfort with emerging identity with one or more domains
	Parents and teachers encouraging teachability	Learning to work effectively in group instructional situations and learning to work alone in pursuing interests for a developmentally appropriate amount of time
	Parents seeking assessments from teachers, coaches to guide the provision of opportunities	Learning to persist in the face of challenge or difficulty
	Parents and teachers reinforce a growth mindset	<ul style="list-style-type: none">• developing grit and self-control• adopting a growth mindset• learning to delay gratification• learning emotional regulation• growing capacity to deal with competition and setbacks• openness to feedback and critique
	Parental and teacher support and pressure to achieve automaticity in basic knowledge and skills of the domains	Recognizing areas in which you are intrinsically motivated to work
	Use extrinsic rewards to achieve automaticity of skills and reinforce intrinsic motivation	

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<i>Transforming Competence into Expertise</i>	<p>Parental support but not pressure Arranges environment to allow for intense focus in the domain</p> <p>Teachers/coaches allow for challenge and “biting back”</p> <p>Teachers/coaches transfer responsibility for assessment of strengths and weakness more to student</p> <p>Teachers and parents promote participation in competitions and other opportunities to “show their stuff”</p> <p>Teachers and parents modeling tasteful self-promotion</p>	<p>Learning to persist in the face of challenge or difficulty</p> <ul style="list-style-type: none">• developing grit and self-control• adopting a growth mindset• learning to delay gratification• learning emotional regulation• growing capacity to deal with competition and setbacks• openness to feedback and critique <p>Addressing the tension between expressing exuberance and self-confidence that comes from lack of self-consciousness with openness to instruction and challenge</p> <p>Developing comfort with intellectual tension</p> <p>Judging optimal levels of psychological independence from teachers, coaches, parents</p> <p>Taking more responsibility for own talent development, shoring up weaknesses and building on strengths</p> <p>Psychological identity that is more strongly tied to talent domain—i.e. musician, mathematician</p> <p>Finding a peer group that shares interest in the domain</p> <p>Deriving personal meaning from chosen talent area</p> <p>Management of affiliation-achievement conflicts</p> <p>Being able to identify successful and unsuccessful self-promotion</p>
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(Continued)

Table 1. (Continued)

<i>Stage of talent development</i>	<i>Inputs</i>	<i>Psychosocial skills response</i>
<i>Transforming Expertise into Eminence</i>	Teachers provide explicit instruction and sharing of tacit knowledge about the domain	Greater awareness of gatekeepers, important benchmarks
	Teachers and parents help to restore self-confidence after setbacks and comparisons with gifted peers/explicit teaching of strategies and coping skills	Practicing coping skills, explicit acquisition of strategies
		Reliance on positive emotions such as optimism, hope
		Coping skills for perfectionism, pressure/stress, performance anxiety, threats to self-confidence
	Teachers and parents model and teach social skills to engage others and foster collegiality	Developing strategies to resist negative peer pressure, negative stereotypes
		Appropriate interactions with peers, teachers, gatekeepers
	In fields with low pay or ones that require long periods of training, parents provide financial support if necessary and if able to	Individuals capitalize on strengths and minimize weaknesses
	Teachers change relationship in the direction of protégé to peer	Responsible for persistence through good and bad times
		Juggle competing priorities
		Responsiveness to extrinsic rewards—individuals focus on opportunities to publish and compete, financial independence and recognition
		Balancing extrinsic and intrinsic motivation, using extrinsic motivation as needed
		Recruit a mentor or agent to help with self-promotion
		Development of a personal vision or unique niche
		Trusting intuition and avoiding entrenchment
		Risk taking to tackle conceptual problems with uncertain outcome and payoff

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Mentor or agent conducts promotion on the part of the talented individual and helps him/her find unique niche	Charisma displayed through personality and/or sheer power of one's work—essential for attracting students and colleagues
	Network and use tacit knowledge
	Use social skills and networking to support work through collegiality and good communication skills
	Self-confidence—necessary to exude confidence in order to inspire the confidence of colleagues, even if you don't feel it
	Ability to gracefully handle critique and criticism
	Ability to cultivate supporters and patrons

Note. This table was previously published in Olszewski-Kubilius, P., Subotnik, R. F., & Worrell, F. C. (2015). Rethinking giftedness: A developmental approach. Revista de Educacion, 368, 245–267.

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Domain Specific Gifted Education and Public Policy

Established gifted education programs and identification processes have been in place for many years in many localities. Thus, there may be resistance to making changes that threaten the hard earned recognition gained from these efforts. Nonetheless, we present here a few arguments for the advantages of domain-focused gifted education programs:

- A program focused on one subject area or domain is easier to manage and organize. Students can be identified using concrete evidence of deep interest and ability in that subject. Teachers can be identified based on the same criteria. Benchmarks for progress can be more concrete and easier to evaluate.
- The public can understand the idea of someone being gifted in mathematics, creative writing, or foreign language. It is far more challenging to elicit support for children for “being smart,” especially when there are no benchmarks or expectations for achievement.
- Focus on a particular domain or related domains (e.g., STEM or literary arts) also allows for easier affiliation with teaching and professional groups that specialize in those areas. These connections provide political and professional support for gifted programs.

CONCLUSION

We are not promoting the elimination of programs that are designed to support the needs of academically talented students who have not yet identified a passion or special ability, particularly in the very youngest grades. However, a drawback for resisting the urge for specialization is giving up the rare opportunity offered in schools to delve deeply into a subject, where lessons of discipline and creativity may be invaluable. The challenges of changing schedules, policies, admissions criteria, and teacher preparation to reflect a more domain specific gifted education may seem daunting, but they are solvable with sufficient time and will. What will be more difficult, in our view, is identifying a set of variables that can serve as the basis for recognizing special ability in a domain, those variables that are necessary, even if not sufficient, for transforming potential into achievement and beyond.

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6. HOLISTIC PERSPECTIVES ON GIFTED EDUCATION FOR THE 21ST CENTURY

In many European countries, such as Finland, education aims to support the development of the whole person rather than merely the cognitive domain. This kind of education acknowledges the importance of social and affective domains in student development, including their emotional and spiritual concerns (Tirri, 2011a). For last two decades the Finnish school system has been very successful in international comparative studies on student achievements (PISA), most recently in 2012, in mathematics, science and reading achievements. These achievements and high-quality teacher education have made Finland an exemplar country in education that other countries all over the world want to emulate (Tirri, 2014).

The Finnish school system provides an interesting and unusual context for educating gifted students. First, the nature of the Finnish school system is egalitarian, where the main purpose of education is to maintain equality, manifested in taking care of the weakest students, such as children with learning difficulties. The practical implementation of this principle makes education free at all levels because the government finances public sector educational institutions and thus only small number of schools in Finland are private. This has led to a situation in which there are no definitions of giftedness or identification criteria used in the schools (Tirri & Kuusisto, 2013; Laine, Kuusisto, & Tirri, 2014).

Further, gifted students are mainly taught in mixed-ability classrooms. The principle is that teachers should choose teaching methods in a way that considers students' individual characteristics, needs, and interests. Therefore, teachers should differentiate their teaching in order to take into account the needs of different students. Even though gifted students are not explicitly mentioned in the national core curriculum for basic education, they can be understood as being included. In other words, all students in Finland, including the gifted, should be educated with particular attention given to their individuality. There are also other possibilities for gifted students such as early entrance, skipping a grade, and summer camps (Tirri & Kuusisto, 2013), but the existence of these options does not guarantee that they are used regularly in practice (Laine et al., 2014).

In Finland the goals of education are established in the national curriculum (for example, National Core Curriculum for the Secondary School 2003). Both teachers and students should agree on the goals and aims of education in order to make them

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meaningful in the teaching – studying – learning process (Tirri & Ubani, 2013). The 21st-century curricula in Finnish schools continue the trend of individualism and make room for diverse education including gifted students. In teacher education, we want to educate teachers who can reflect on the educational purposefulness of their teaching from different points of view and also who can help their students to find purpose in their lives (Bundick & Tirri, 2014). We also identify a growth mindset as a key to lifelong learning and creative thinking (Dweck, 2009). The 21st-century skills include an open-minded attitude and a growth mindset to learning that make it possible to continually challenge students to learn new things in multiple intelligence domains (Gardner, 1999). Both teachers and students need to be educated for this kind of mindset to give room for gifted students to actualize their full potential in their multiple intelligences (Tirri & Nokelainen, 2008; Tirri & Nokelainen, 2011; Tirri, Nokelainen, & Komulainen, 2013).

The sense of purpose and growth mindset in learning needs to be complemented with ethical skills in order to combine excellence with ethics. Skills in moral judgment and especially in moral sensitivity are necessary in order to live a moral life (Tirri, 2011b). Gifted students create new ideas and products that can be used for the benefit of our society. However, the creative process in science includes many ethical issues that need to be considered before introducing a new idea or product to society.

In this chapter I emphasize three perspectives that are important for the holistic education for gifted students in the 21st century. They include values and worldviews that help young people find purpose in their lives; a growth mindset for learning that promotes creative thinking, and ethical skills that are needed to live a moral life. In this chapter I discuss these three perspectives in the context of teaching and learning in schools and provide some case examples from empirical studies with Finnish teachers and students to address the holistic nature of educating gifted students.

VALUES AND WORLDVIEWS

Values and worldviews have been identified as important aspects of school pedagogy in educating gifted students (Tirri, 2011a). Teachers need to identify and to verbalize educational goals and meanings for their teaching in order to meet the aims of holistic education. In an empirical study with two Finnish secondary schools with gifted programs in mathematics, some field-invariant pedagogical components in holistic school pedagogy were identified. All the teachers ($N = 19$) in a study emphasized the importance of providing the students with the skills and tools to form a worldview. These skills include independent thinking, argumentation skills, and ethical reflection, skills very much accord with the skills for the 21st century. They need to be complemented with the mastery of the central concepts in each subject taught in school providing the students the vocabulary they need for this kind of discussion and reflection.

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The students from these same schools ($N = 37$) emphasized the importance of the school community to their learning (Tirri, 2012). This community included both teachers and like-minded friends. The special curriculum in both schools attracted students with similar interests and provided them with both the cognitive and emotional skills necessary for their personal growth. In addition to good social relations, many students ($N = 17$) felt that having goals in life was very important. Goals gave them a purpose in life and helped them to thrive in their studies. The most frequently mentioned goals were having a good profession, such as a medical doctor or a scientist, as well as wisdom and intelligence, money and success. They also identified traveling and learning about different cultures as worthwhile goals in life. Three students felt that happiness in life means helping other people. Among the things they valued most in life, they included different altruistic behaviors in helping others. Two students, one a Muslim and the other a Christian, listed religion as the greatest value in their lives. One student also mentioned nature as the most important thing in life. These results are very much in accord with the results reported among young urban adults. In these studies among young urban adults, Finnish youth rated voluntary organizations, politics and religion as the least appreciated areas of life. In one study, gifted adolescents themselves identified altruism and religion as important values in life (Tirri, 2011a).

All of the students valued knowledge and science, reflecting aspects of a naturalistic worldview. In addition, of the 37 students, 10 (6 boys and 4 girls) expressed a theistic worldview in their interviews. Five of these students expressed their beliefs directly by stating that they are Christians. In their interviews, 5 (4 boys and 1 girl) of the 37 students expressed a naturalistic worldview incorporating atheism. A total of 21 adolescents (14 boys and 7 girls) reflected agnosticism in their worldviews. Five of them expressed a more negative than positive attitude towards faith and believing. Of the 21 adolescents with agnostic views, 16 saw belief, faith, or religion in a positive light. All of the adolescents said that knowledge and science are more important to them than beliefs. However, many of them viewed faith and belief as imbuing life with a sense of purpose or an extra dimension. In both schools, students had an opportunity to form a worldview and were able to discuss it with both scientific and religious components. Even though the students could express their own values and worldviews, they also showed respect and tolerance of diversity and a readiness to engage in dialogue with others who held worldviews different from their own (Tirri, 2011a).

These findings offer grounds for some concrete pedagogical applications for teaching and learning in the context of gifted education. The teachers of different subjects should plan their teaching with clear educational purposes. These purposes should reflect the values and worldviews underlying the subject matter taught. Students should be provided the necessary skills and concepts to discuss and reflect upon each subject matter taught in school. The results of the study also point to the importance that values and worldviews have in the process of finding a purpose in adolescence.

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Purpose can be defined as a stable, long-term goal of contributing to the world beyond the self, which is also meaningful to the self (Damon, Menon, & Bronk, 2003; Damon, 2008). One can identify two kinds of goals in life: one that has as its primary intent the benefit of the world beyond oneself (a purpose), and another that has as its primary intent the benefit of the self (a self-oriented life goal). This conceptualization of purpose emphasizes the essential nature of self-transcendent goals aligned with experiencing purpose in its deepest sense. To this end, a purpose may function not only as a life aim, but also as a *moral beacon*, which motivates one to commit to and engage in pro-social, generative behaviors in adolescence and the years to follow (Damon, 2008). To live purposefully, one must understand one's purpose(s) in life, plan and be future-oriented, and believe that one has the capacity to achieve one's life goals. Teachers need a sense of purpose to find their work educationally meaningful, and also to be able to foster purposefulness in their students. Students need a sense of purpose to find studying and learning worthwhile and to find a goal and challenge for their future. The role of teachers is also acknowledged as important in different countries to foster purpose among the youth (Tirri, 2014; Bundick & Tirri, 2014; Tirri & Ubani, 2013). Purpose can be seen as a key promoter in positive youth development and teachers should be educated for those competencies that make purposeful teaching possible.

GROWTH MINDSET

In the field of positive psychology the research emphasis is on the human potential to grow and develop instead highlighting possible obstacles and problems. Carol Dweck's (2006) theory of mindsets builds on this positive psychology approach to the malleable nature of human intelligence in line with neuroscientific findings on the adaptive brain (e.g., Kujala & Näätänen, 2010). According to Dweck's definition, mindsets are beliefs that individuals hold about their most basic qualities and abilities. In a growth mindset, people believe that intelligence, personality, and abilities can be changed. In contrast, people with a fixed mindset believe that basic qualities, such as intelligence, are static and cannot be changed.

Research has shown that students' mindsets play a vital role in learning success and in confronting educational challenges. Mangels et al. (2006) found that students who saw intelligence fixed-mindedly emphasized performance goals more ("looking smart") whereas students with a growth mindset emphasized learning goals more ("becoming smart"). The former leaves students vulnerable to negative feedback and can lead to an avoidance of challenging learning opportunities, whereas the latter helps students to handle failure better (Mangels et al., 2006). Similarly, it has been found that students with a growth mindset have higher achievement during challenging school transitions and their completion rates are higher in demanding school courses (Blackwell, Trzesniewski, & Dweck, 2007; Yeager & Dweck, 2012). Furthermore, the growth mindset, either innate or taught, seems to lower adolescents' aggression and stress, and enhances their school performance

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(Yeager, Trzesniewski, & Dweck, 2012; see also Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011).

Our recent study on teachers' implicit theories has revealed that Finnish teachers ($N = 212$) have fixed, growth or mixed mindsets regarding students' giftedness that can potentially influence teaching and learning behavior in schools (Laine, Kuusisto, & Tirri, 2014). We have also found that students' parents tend to have mainly fixed mindsets (Kuusisto & Tirri, 2013). In addition, according to previous research mindsets are quite stable but changeable through educational interventions (Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2012; Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011; Yeager & Dweck, 2012). In such interventions the main point has been to teach the participants about the neuroplasticity of the brain and its potential to change and reorganize itself when people learn and practice new ways of thinking (Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Yeager & Dweck, 2012). We argue that a growth mindset is a key to lifelong learning in all human domains (Dweck, 2009). It is also an important factor in the 21st century in order to cope with, enjoy, and act upon various and ever-changing challenges.

ETHICAL SKILLS

According to current knowledge, moral experts demonstrate holistic orientations and skillsets within four processes of ethical behavior: ethical sensitivity, ethical judgment, ethical motivation, and ethical action (Bebeau, Rest, & Narvaez, 1999). Although all of these skills are essential, the most important is ethical sensitivity because it is needed for recognizing and understanding ethical problems and their cues. According to Bebeau, Rest and Narvaez (1999), moral sensitivity is about the awareness of how our actions affect other people. Thus, without possessing moral sensitivity it would be difficult to see the kind of moral issues that are involved in science. However, to respond to a situation in a moral way, a scientist must be able to perceive and interpret events in a way that leads to ethical action. A morally sensitive scientist notes various situational cues and is able to visualize several alternative actions in response to that situation. He or she draws on many aspects, skills, techniques and components of interpersonal sensitivity. These include taking the perspective of others (role taking), cultivating empathy for others, and interpreting a situation based on imagining what might happen and who might be affected. Moral sensitivity is closely related to a new suggested intelligence type, social intelligence, which can be defined as the ability to get along well with others and get them to co-operate with you (Albrecht, 2006; Goleman, 2006).

Our previous studies on ethical sensitivity in Finnish and Iranian teachers (Kuusisto, Tirri, & Rissanen, 2012; Gholami & Tirri, 2012a; Hanhimäki & Tirri, 2009) have shown its importance in teaching. Generally, teachers evaluate their ethical sensitivity quite high with an emphasis on caring ethics (Kuusisto, Tirri, & Rissanen, 2014; Gholami & Tirri, 2012b). The studies among students

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have indicated that females and high-ability students tend to score higher in ethical sensitivity than males or average-ability students (Gholami & Tirri, 2012a, 2012b; Kuusisto, Tirri, & Rissanen, 2012; Schutte, Wolfersberger, & Tirri, 2014; Tirri & Nokelainen, 2007). Even though gifted students usually score quite high in ethical sensitivity in self-reports they need more education in working as a team (Kuusisto & Tirri, 2014).

Our recent case study investigated the social interactions, especially the disagreements, of five gifted science students (Kuusisto & Tirri, 2014). The data were gathered by videotaping international students' teamwork sessions during an enrichment summer program in Finland in 2012. Disagreements were analyzed from the point of view of style and theme, as well as with a disagreeing profile. The results revealed that the gifted students' disagreeing style was mainly aggravated when they contradicted their counterparts explicitly and frankly. Inductive analyses of the themes showed that the students were highly task-oriented. They argued mostly about production process and knowledge accuracy, which reflects characteristics of gifted students in terms of high levels of curiosity, perfectionism and intellectual honesty. The students did not often disagree about the learning environment or peer relations. However, a few arguments regarding peer relations escalated into non-constructive conflicts. In these situations, the group would have benefitted from the intervention of a professional and ethically sensitive teacher who could have moderated the situation (Kuusisto & Tirri, 2014).

Skills in ethical sensitivity are necessary in teamwork and in combining excellence with ethics. Combining excellence with ethics relates to ethical models developed in the academic context, such as Pekka Himanen's theoretical approach to the hacker ethic. In his work, Himanen (2001) introduced a new kind of ethic, the *hacker work ethic*, that has replaced the dominance of the Protestant work ethic with a passionate attitude and relationship to one's work. With the word *hackers*, he referred to people who did their work because of intrinsic interest, excitement, and joy, whereas the Protestant work ethic emphasized work as a duty and a calling. Successful scientists resemble the hackers with their strong inner drive to excel (Koro-Ljungberg & Tirri, 2002; Tirri & Campbell, 2002). Hackers wanted to realize their passion together with others, and they wanted to create something valuable for the community and be recognized for that by their peers.

A passionate attitude towards work, a desire to learn more about subjects and phenomena, was not an attitude found only among computer hackers in Himanen's study, but also among science researchers. Gifted, creative scientists need an ethic of empowerment that is built on their own inner drive to excel and create new things. The hacker work ethic includes many aspects suited to the gifted and creative minds that help the scientists to combine ethics with creativity. Ethical sensitivity includes similar components as hacker ethics. Hackers wanted to realize their passion together with others, and they wanted to create something valuable for the community and to be recognized for that by their peers. In a similar way, ethical sensitivity builds on caring and communication with the idea of finding new

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innovative solutions to ethical dilemmas in the community of ethically sensitive people (Tirri, 2013).

RECOMMENDATIONS FOR 21ST-CENTURY GIFTED EDUCATION

In this chapter I have presented three perspectives that are important for a holistic education for gifted students in the 21st century. They include values and worldviews that help young people to find purpose in their lives; a growth mindset for learning that promotes creative thinking, and ethical skills that are needed to live a moral life. Some examples from studies including Finnish teachers and students were presented to demonstrate the role of values and worldviews in finding purpose in life. Moreover, the importance of educating teachers to reflect on the purpose of their own subjects taught was discussed as an essential feature of purposeful teaching. Educating for growth mindsets in learning was another perspective that is important for the holistic education of gifted students in the 21st century. A growth mindset allows challenges and creative ideas to bloom in the classroom and encourages gifted students to try harder instead of simply trusting their current abilities. Teachers and parents of the gifted also need this kind of a mindset to support gifted students in exploring their multiple intelligences instead of being stuck to only certain kinds of talents.

Gifted students need ethical skills to be able to understand different opinions and diverse people. Ethical sensitivity is a key competence to recognize ethical issues in science and to be able to cooperate in teams with other scientists from different cultural backgrounds. The hacker ethic was introduced in this chapter as a possible ethical approach to studying and working for gifted students because it emphasizes passionate attitudes towards work and a strong inner drive to excel. Hackers also want to realize their passion together with others and to create something valuable for the community. These kinds of goals call for social skills and ethical sensitivity in cooperation.

Teachers can take advantage of case studies on gifted science students and researchers to demonstrate the nature of ethics needed in scientific studies and work. In a published case study with high school students concerning the moral dilemma of archeological studies in graves, the argument analysis demonstrates that responsible moral judgments for the moral dilemmas in science require moral motivation and moral sensitivity (Tirri & Pehkonen, 2002). In this dilemma, ethically sensitive and creative solutions are needed together with communication and negotiation skills. The teachers can use the argument model presented in the study to discuss the moral dilemmas in science with their students. Ethically sensitive and creative solutions should be encouraged and modeled in science teaching (Tirri, 2014).

The second published case study explores further the questions of gifted international high school students (Tirri, Tolppanen, Aksela, & Kuusisto, 2013). This study points to the need for teachers to teach socio-scientific issues as part of the science curriculum and discuss moral questions in science, which might influence the future of humankind. The Millennium Youth Camp and other available summer

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enrichment programs provide great opportunities for gifted international high school students to meet like-minded friends and to be challenged both academically and socially. Furthermore, this kind of international summer camp has a strong emphasis on global responsibility. Therefore, it covers many aspects of social, emotional, and moral education that have been neglected in gifted and science education. It also provides the peers that are needed in the hacker ethic to inspire students to give their bestpassionate efforts in their studies (Tirri, 2014).

The third published case-study provides more evidence that ethical orientations of care and justice are insufficient to explain the essence of moral orientations among scientists (Koro-Ljungberg & Tirri, 2002). Therefore, the conceptualizations and understandings of scientists' work ethics must go beyond justice and care-oriented reasoning. Gifted, creative scientists need ethics of empowerment that is built on their own inner drive to excel and create new things. The hacker work ethic includes many aspects that suit gifted and creative minds (Tirri, 2014).

A holistic approach to gifted education challenges our teachers and educators to acknowledge the multiple intelligences of their students including moral and spiritual domains. Moreover, educators need to reflect on their own values and worldviews to be able to purposefully teach their students and guide them to find their own purpose in life. Teachers should also model a growth mindset for learning that would guide their gifted students to try harder and look for hard challenges instead of easy learning tasks. In this search for excellence, ethical skills, especially ethical sensitivity would guide both teachers and students to live a moral life by combining excellence with ethics.

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7. THE MACROPROBLEM OF CONFLICTING VALUES IN 21ST-CENTURY EDUCATION

Making the quantum leap to the top of the 21st century globalization wave (Ambrose, chapter 2, this volume) will require a nimble citizenry, one that can readily adapt to the changing landscape in technology, economics, health care, education, and the environment, to name just a few of the enormous macroproblems we face. Looking around us at the beginning of the 21st century, it is hard to imagine a global citizenry that could reach agreement on important actions in almost any of these areas. Differing core values, including beliefs about equality, can create barriers to communication, collaboration, and joint decision-making, all of which are necessary to educate 21st century citizens. The flexible habits of thought needed to make the quantum leap can be fostered through education, but what should be taught, how, and to whom? Disagreements over these important questions may lead to rejection of potential solutions or even, in the worst case, to war. To address the most important issues of our time, conflicting values must be recognized and acknowledged in any proposed solution. By examining Schwartz's value theory and related constructs, this chapter aims to infuse values into the conversation about solving 21st century problems.

CONFLICTING VALUES IN THE NEWS

Conflict erupts from many sources: power struggles, protection of or demand for resources, individuals seeking personal profit, just to name a few. At the root of some conflicts are disagreements about what is right and wrong. Evidence that such conflicting values are an issue that must be dealt with in the 21st century is everywhere in our daily news. Individuals are regularly harmed by others who are attempting to uphold their highest values. The following examples of conflict over acceptable social hierarchies, the control of knowledge dissemination, and the priority of environmental or economic concerns are a few of the most obvious cases in recent news reports.

In 2014, the Nobel Peace Prize was awarded to Malala Yousafzai, a Pakistani girl who, at age 15, survived an assassination attempt ordered by Taliban leaders for her activism in support of education for girls in Pakistan. The announcement was hailed by many in Pakistan and around the world. After the award, the BBC Newshour radio program host interviewed a former editor of the Pakistani Observer,

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a national newspaper, who expressed what apparently was becoming a common belief throughout the country: Malala's attack was actually a Western conspiracy, designed to pressure Pakistanis to accept Western-style education. Such education is morally corrupt and will pollute the minds of young Pakistanis (BBC Newshour, 10/10/14; Masood & Walsh, 2013), claimed the editor.

The Nigerian Islamic extremist group Boko Haram, translated as "Western education is forbidden" (Newman, 2013), has shocked the world with its acts of terror as it attempts to establish *sharia law* across the country, kidnapping more than 200 school girls in April, 2014, and killing thousands of civilians since its first appearance in 2009.

North Korea is frequently in the news, threatening to use its nuclear weapons to destroy its neighbors, South Korea and Japan, for their support of a United Nations' recommendation to refer North Korea to the International Criminal Court for investigation of human rights violations (Shearlaw, 2014). North Korean children hear throughout their school careers of the fantastic accomplishments of their leaders, first Kim Il Sung, then Kim Jong Il and now Kim Jong Un (Kim, 2013). Not only are these young people misled into believing stories of their leaders' superhuman feats, they are also convinced of their superior military might, which will lead to the domination of their greatest enemies, South Korea and the United States. With strict control over all education and news outlets, the North Korean authorities can wholly shape students' thinking.

Thousands of demonstrators in Hong Kong in the fall of 2014 were protesting a change to their electoral system (BBC News, 2014). In August, the Chinese government announced that the people of Hong Kong would no longer be able to freely choose their own candidates to represent them in Beijing. Instead, they would elect representatives from two to three candidates selected by a nominating committee.

In 2014, the 113th Congress of the United States, a group of people elected to represent all Americans, was one of the most unproductive in over 100 years (Sherfinski, 2014, December), with the prior year's 112th Congress holding the record for least productive in history. Members of the two dominant political parties, Democrats and Republicans, disagree on almost every substantive issue. Fierce rhetorical battles over such issues as a minimum wage and health care for all Americans indicate the chasm between the values of the two political parties. Mired in disagreement, Americans are stumbling into the Hobbes trap (Ambrose, chapter 2, this volume), the area under the crest of the 21st century globalization wave, where there is little hope of overcoming macroproblems or taking advantage of macro-opportunities. Our path to this dimly lit future is taking shape not due to an inability to be creative or a lack of ingenuity, but to an inability to collaborate.

These examples from recent news reports illustrate widely different values held by large numbers of people as we consider "catching the wave" of globalization in the 21st century (Ambrose, chapter 2, this volume). Widely disparate value orientations threaten the success of the global community. Agreeing on a course of action in

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the pursuit of macro-opportunities will be challenging in diverse communities, but agreeing how to define “success” may be the greatest macroproblem we face. Without a shared vision of “success,” citizens of the 21st century will be unable to make the quantum leap onto the globalization wave. Individuals and even countries hold dramatically differing values (Schwartz, 2006). Unless we recognize and understand basic differences in the values that underpin behaviors and motivations, we will be unable to collaborate for a better future. Values are beliefs, which are cognitions. Cognitive diversity includes diversity of values. Solutions that call for collaboration require that we understand and accommodate diverse, even conflicting, values.

CONCEPTIONS OF HUMAN VALUES

Human values are the evaluations one makes of desirable states or behaviors. They are not simply accepted norms, although these may have an influence on the values one holds. They are not simply attitudes, although attitudes are related. Rokeach (1968–1969) contrasts attitudes – “an enduring organization of several beliefs focused on a specific object (physical or social, concrete or abstract) or situation, predisposing one to respond in some preferential manner” – with values, which:

transcend specific objects and specific situations: values have to do with modes of conduct and end-states of existence. More formally, to say that a person “has a value” is to say that he has an enduring belief that a particular mode of conduct or that a particular end-state of existence is personally and socially preferable to alternative modes of conduct or end-states of existence. (p. 550)

It is the transcendence of specific situations and the evaluative nature of values, the belief that one’s values *should* have a priority, in life or the world, that distinguish them from attitudes. Schwartz (2006) includes a hierarchical component in his definition of values. The differing priorities of the values one holds form a system that serves to guide behavior and support or opposition to policies and practices. What one believes is right and good or important develops through socialization and life experiences. As we construct our knowledge base from the day we are born, our values are developing. Based on life experiences, we attribute importance to beliefs that are salient in various contexts.

Considering their ubiquity and importance to us as individuals, research on values has had relatively little impact on modern psychology (Gecas, 2008). The dominance of behaviorism curtailed studies of values, beliefs, attitudes; mental constructions that cannot be observed. Early psychologists described human values as reflective of personality. Vernon and Allport (1931) considered subjective values to be the best indication of a person’s “total personality” (p. 231). In his essay on “valuations,” Dewey (1939) described values as desires with “ends-in-view” (p. 66). Combining these perspectives of values as personality-based and goal-oriented, Rokeach (1968–1969, 1973) collected lists of values from a variety of sources, including

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dictionaries, interviews, and relevant literature reviews, creating his Rokeach Value Survey (RVS; 1973) a widely used instrument for exploring human values.

The current direction of research in human values is being led by Schwartz (1992, 2006). Schwartz and Bilsky (1987) proposed that human values meet certain requirements around which their theory has developed: “biologically based needs of the organism, social interactional requirements for interpersonal coordination, and social institutional demands for group welfare and survival” (p. 551). Schwartz’s (1992) circumplex model (see Figure 1 for an updated version) indicates relationships among 10 value types: *self-direction*, *stimulation*, *hedonism*, *achievement*, *power*, *security*, *conformity*, *tradition*, *benevolence*, and *universalism*. *Spirituality* was originally included as a value type, but was dropped when found to be non-universal (Schwartz, 1992). The values are ordered along the circumplex in four opposing over-arching dimensions: *openness to change* and *conservation*; *self-transcendence* and *self-enhancement*. The Schwartz Values Survey (SVS) includes items intended to represent each of these value types (see Table 1) and respondents are asked to rate how much each value is “a guiding principle in my life” on a 9-point scale from -1 (*opposed to my values*) to 7 (*of supreme importance*).

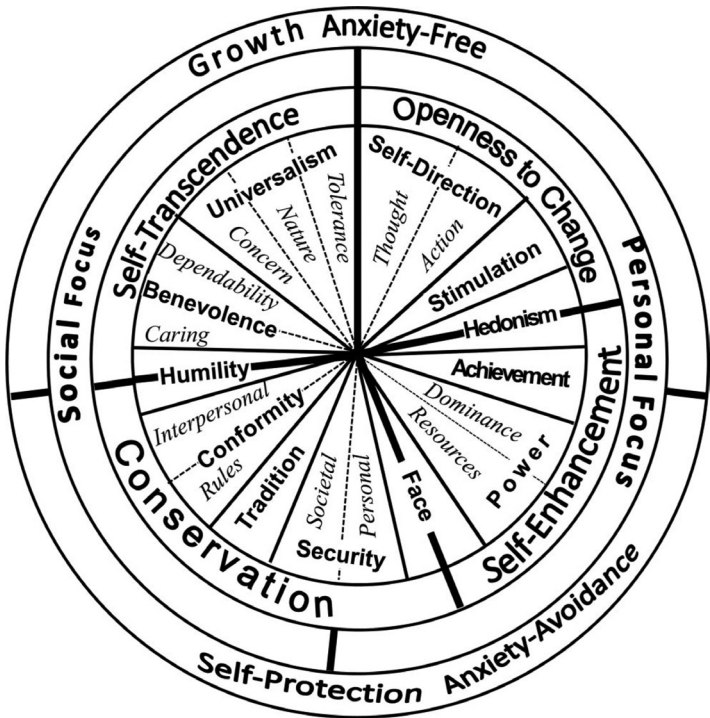


Figure 1. Refined circumplex model of human values.
Reprinted with permission from Schwartz, Cieciuch et al. (2012), p. 669

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Table 1. Individual and cultural value types and SVS items

<i>Individual value type</i>	<i>Item</i>	<i>Cultural value</i>
Self-Direction	Freedom	Intellectual autonomy
	Creativity	Intellectual autonomy
	Independent	Mastery
	Choosing own goals	Mastery
	Curious	Intellectual autonomy
	Self-respect	
Stimulation	An exciting life	Affective autonomy
	A varied life	Affective autonomy
	Daring	Mastery
Hedonism	Pleasure	Affective autonomy
	Enjoying life	Affective autonomy
Achievement	Ambitious	Mastery
	Influential	Mastery
	Capable	Mastery
	Successful	Mastery
	Self-respect	
Power	Social power	Hierarchy
	Wealth	Hierarchy
	Authority	Hierarchy
	Preserving my public image	Embeddedness
	Social recognition	Mastery
Security	National security	Embeddedness
	Reciprocation of favors	Embeddedness
	Family security	Embeddedness
	Sense of belonging	
	Social order	Embeddedness
	Healthy	
	Clean	Embeddedness

(Continued)

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Table 1. (Continued)

<i>Individual value type</i>	<i>Item</i>	<i>Cultural value</i>
Conformity	Obedient	Embeddedness
	Self-discipline	Embeddedness
	Politeness	Embeddedness
	Honoring of parents and elders	Embeddedness
Tradition	Respect for tradition	Embeddedness
	Devout	Embeddedness
	Accepting my portion in life	
	Humble	Hierarchy
	Moderate	Embeddedness
Benevolence	Helpful	Egalitarianism
	Responsible	Egalitarianism
	Forgiving	Embeddedness
	Honest	Egalitarianism
	Loyal	Egalitarianism
	Mature love	
	True friendship	
Universalism	Equality	Egalitarianism
	Unity with nature	Harmony
	Wisdom	Embeddedness
	A world of beauty	Harmony
	Social justice	Egalitarianism
	Broad-minded	Intellectual autonomy
	Protecting the environment	Harmony
	A world at peace	Harmony

Note: Adapted from Schwartz (1992, pp. 6–7) and Schwartz (2006, p. 147)

In a fine example of the open-minded scientist, Schwartz has collaborated with others to modify his theory of human values in response to various studies with findings suggesting needed changes. The refined theory includes further distinctions of the original 10 value types, adding 9 clarifications (e.g., security has been

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subdivided into *security-personal* and *security-societal*). In addition, Schwartz, Cieciuch et al. (2012) proposed two new value types, *humility* (“recognizing one’s insignificance in the larger scheme of things” [p. 669]) and *face* (“Security and power through maintaining one’s public image and avoiding humiliation” [p. 669]). The 19 values in the new model are ordered to align with the motivations for each value, those with a personal focus or a social focus and within the *openness to change* and *conservation* and *self-transcendence* and *self-enhancement* dimensions.

Values as measured by the SVS have been found to predict acceptance of immigrants (Schwartz, 2007) and to be related to behaviors indicated by the values (e.g., taking on many commitments was associated with achievement value), although some of these relationships were stronger than others (Bardi & Schwartz, 2003). Meeusen, Delvaux and Phaet (2014) found that values of achievement in groups of college students working together on a project became more similar over time and this convergence predicted identification with the group. Attitudes toward war and violence were associated with the conservation values of tradition and conformity among Swedish college students (Sundberg, 2014). An intervention study found that benevolence values could be enhanced among college students in the US and Israel (Arieli, Grant, & Sagiv, 2014). Among the thousands of participants in the European Social Survey, openness to change values were associated with a left-wing political orientation and activism, but this differed in Eastern and Western European countries (Roets, Cornelis, & Van Hiel, 2014). In general, the findings of studies suggest the usefulness of value orientations in understanding individual differences and potentially resolving conflict.

Cultural Value Orientations

Schwartz’s theory of individual values has been utilized in many cross-cultural studies by Schwartz and others (e.g., Daniel, Schiefer, & Knafo, 2012; Knafo, Schwartz, & Levine, 2009; Lee, Soutar, Daly, & Louviere, 2011; Schwartz & Sagie, 2000; Stelzl & Seligman, 2009). The differences in value orientations between individuals within various cultures have been frequently tested. Making the shift from individual value orientations to those of the broader cultures, Schwartz (2006) developed a theory of cultural values. His theory is based on the proposition that all cultures deal with three critical issues: (1) the relationship of the individual to the group, (2) preserving the social fabric through the management of individuals’ behavior, (3) managing the relationship of individuals to nature and one another. These issues produce opposing value dimensions.

To describe the values relevant to the first issue – the relationship of the individual to the group – Schwartz (2006) considered the polar opposites of *embeddedness* and *autonomy*, which is of two types: *intellectual* and *affective*. Individuals are free to pursue their own intellectual goals and interests (intellectual autonomy) or pleasurable experiences (affective autonomy). On the other end of this dimension is embeddedness, in which individuals are considered part of the collective to which

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they are responsible and with whom they share goals. In embedded cultures, lives are structured around social relationships, whereas autonomous cultures emphasize and support individual pursuits.

To maintain the social fabric, members of a society must be productive and considerate of others' rights and welfare. How this is done varies depending on the culture's values, from an emphasis on *egalitarianism*, where all members are seen and treated as equals, to a *hierarchy*, where there is an unequal distribution of power and individuals at the top of the hierarchy have authority over those in lower positions. In a hierarchical society, the people accept the structure and their roles and adhering to rules and fulfilling obligations are understood as necessary for the good of society. Members of an egalitarian society learn to cooperate and work towards the welfare of others, whom they consider to be equally valuable members of the community.

Schwartz (2006) conceptualized a culture's relationship with nature and society as being either in *harmony* with both or attempting to gain *mastery* over both. A harmonious culture emphasizes unity with nature and one another, valuing appreciation of nature and people as they are rather than attempting to change them. A culture that values mastery encourages its people to take control of and even change their environs.

These conceptions of cultural values could be derived from assessments of individuals' values. Table 1 indicates the individual value items Schwartz (2006) used to identify the cultural values. Using data from more than 15,000 teachers and college students from 67 nations, Schwartz calculated averages for each country, which he could then plot using a multidimensional scaling technique. The locations of each country in Figure 2 were determined from a matrix of differences between all countries in the average scores on each of the seven cultural values. Schwartz describes this plot as indicating:

the ways in which national cultures resemble or differ from one another. For example, the farther a nation toward the upper right, the greater the cultural emphasis on embeddedness relative to other nations and the farther toward the lower left, the less the cultural emphasis on embeddedness. To locate a nation on a cultural orientation, draw a perpendicular line from the position of the nation to the vector for that orientation. Perpendiculars drawn to the embeddedness vector in Figure [2] show that this orientation is especially emphasized in Yemen, less so in Macedonia, and very little in East Germany. (p. 155)

It is evident that each culture may have dramatically different priorities and individuals within them may reason very differently from members of a culture located on a different part of the map. Based on the averages in Schwartz's sample, the US is very mastery oriented, with greater affective than intellectual autonomy and much more hierarchical than egalitarian.

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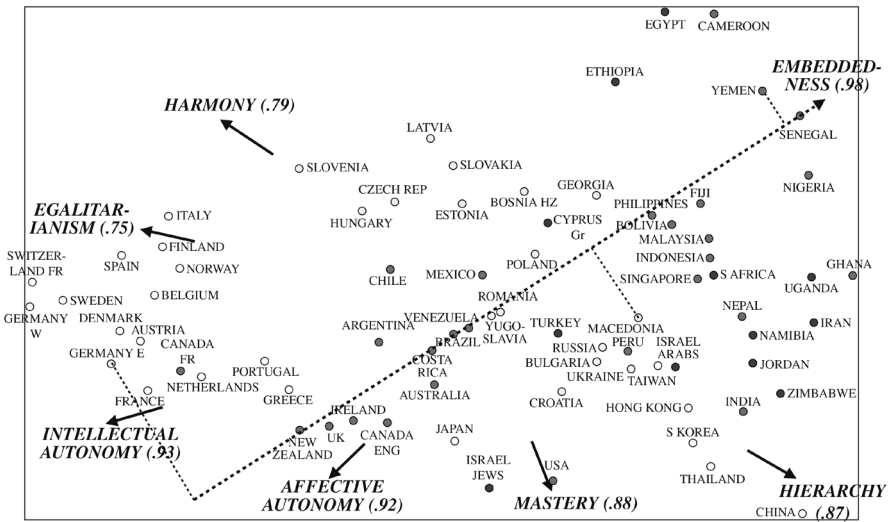


Figure 2. Co-Plot map of 76 national groups on seven cultural orientations (coefficient alienation .11). Reprinted with permission from Schwartz (2006), p. 156

Schwartz’s (2006) exploration of values as country or cultural group averages was challenged by further research. In three studies utilizing data from more than 60 countries and 169,214 subjects, Fischer and Schwartz (2011) found little support for country differences in values. There was strong support, however, for the universality of autonomy and benevolence values. Individuals within countries did not share values as much as an average score, as Schwartz (2006) used, would indicate. Cultural values are not the same as individual values, but aggregated individual values produce a latent variable, which Fischer and Schwartz see as valuable to cross-cultural research. Mean scores of values for a country “serve as manifest markers for the latent culture and can be used to measure cultural differences. Even relatively small differences in the latent values that guide and justify institutional and national policies may generate substantial intergroup and international conflict” (p. 1140).

These findings have important implications for anyone offering solutions to 21st-century problems. At the cultural level, we can predict that egalitarian, harmonious and embedded solutions might encounter resistance in the US, but not necessarily in Italy. But at the individual level, headway might be made with such proposals in the US, while, at the same time, difficulties might be encountered in Italy. The key to success will be to address these differing values, both cultural and individual, in crafting solutions to 21st-century problems. In any solution, attention to individuals’ self-determination (autonomy, competence and relatedness needs;

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Ryan & Deci, 2001), is strongly suggested by Fischer and Schwartz's (2011) meta-analysis, but how these might be supported in a culture that, on average, emphasizes embeddedness or autonomy, may be very different.

Related Theories

Significant research has been conducted on psychological constructs that are, basically, human values, yet these literatures sometimes do not even intersect. For example, there is considerable overlap in the research on moral foundations and human values. From his analysis of speeches of U.S. Congressmen, Lakoff (1996), a cognitive linguist, developed a moral framework that indicates the opposing values of conservatives and liberals. He identified three primary metaphors that underpin political decision-making: moral strength, moral nurturance, and moral self-interest. As with Rokeach (1973) and Schwartz (1992; Schwartz & Bilsky, 1987), Lakoff proposed that the priority given to each metaphor (its value) creates different frames through which conservatives and liberals moralize or determine what is right and wrong.

The priorities of conservative lawmakers according to Lakoff (1996) are (1) moral strength, (2) moral self-interest, and (3) moral nurturance. Liberals moralize based on the opposite priorities: (1) moral nurturance, (2) moral self-interest, and (3) moral strength. No research has, as yet, examined the relationship between Lakoff's moral politics and Schwartz's value orientations, but the similarities are readily apparent. Moral strength is aligned with Schwartz's conservation and self-enhancement values (tradition/conformity, security, power and achievement), moral self-interest with self-enhancement and openness to change (power, achievement, hedonism, stimulation, and self-direction), and moral nurturance with self-transcendence values (universalism, benevolence). Lakoff points out how the differing priorities between these strength and nurturance moralizers result in an inability to communicate and cooperate to find solutions to society's problems. Schwartz's value orientations have not been so neatly applied to conflicts between those holding opposing values.

Moral explanations for conservative and liberal behaviors have also been examined by Haidt and colleagues (Graham, Haidt, & Nosek, 2009; Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011; Haidt, 2012), who, like Lakoff (1996, 2004), attempted to explain oppositional political orientations in the US through moral foundations. Haidt (2012) has found empirical support for six psychological foundations of morality: care/harm, fairness/cheating, liberty/oppression, loyalty/betrayal, authority/subversion, and sanctity/degradation. In findings similar to Lakoff's (1996), using dramatically different methods, Haidt found that liberals are oriented towards the care/harm, liberty/authority, and fairness/cheating dimensions, with very little emphasis on the others. The most sacred liberal value is to care for the oppressed. Conservatives, on the other hand, emphasized all of the dimensions relatively equally, with the preservation of institutions that sustain morality as the most sacred conservative value. Moral foundation theory does not map directly onto

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Schwartz's values, but parallels can be drawn. In fact, the development of the Moral Foundations Questionnaire (Graham et al., 2011) was based in part on the SVS. For example, care/harm is associated with universalism and benevolence or their opposites, achievement and power. If one is unconcerned about harming others, a desire for self-enhancement is likely taking priority over care for others (self-transcendence). Boer and Fischer (2013), in fact, found these relationships. Liberty/authority and self-direction and security/conformity/tradition are similar constructs. Loyalty could be subsumed by the tradition/conformity values, and betrayal may be associated with hedonism, stimulation and self-direction. One who highly values conformity and tradition may view an individual who pursues his or her own interests for pleasure or stimulation as betrayal. This could also be true of the authority/subversion foundation. Both Haidt's (2012) moral foundations theory and Schwartz's theory of human values attempt to explain beliefs that have important implications for 21st-century problem solving.

Social dominance orientation (SDO; Sidanius & Pratto, 1999) is an individual's orientation towards egalitarianism or hierarchy in society. Testing this orientation with statements such as "If certain groups of people stayed in their place, we would have fewer problems," SDO has been enormously popular in social and political psychological research. Individuals' preference for hierarchy has been associated with several forms of prejudice: homosexual, racial, and ethnic (Duckitt, 2001; Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Whitley, 1999). In Pratto and colleagues' (Pratto, Sidanius, Stallworth, & Malle, 1994) summary of multiple studies, SDO was correlated with opposition to social programs, women's rights, gay and lesbian rights, and environmental programs and with support for military programs. The relationship of prejudice against immigrants and SDO was stronger during periods of economic downturn (Cohrs & Stelzl, 2010). High SDO was associated with low levels of concern for environmental protections and highly correlated with attitudes expressing the appropriateness of utilizing nature for human purposes (e.g., "Plants and animals exist primarily to be used by humans"; Milfont, Richter, Sibley, Wilson, & Fischer, 2013). In a meta-analysis of studies conducted in 27 countries, Milfont and colleagues (2013) found that country-level high SDO was associated with "lower objective environmental quality, reduced environmental concern, and less willingness to act in favor of the environment" (p. 1132). Climate change is a macroproblem we expect to have severe consequences in the 21st century. To garner support for any solutions, values of dominance over nature (Schwartz's [2006] mastery values) and, Milfont et al. would suggest, a preference for social hierarchy, must be considered.

VALUES AND EDUCATION IN THE 21ST CENTURY

According to Ambrose (chapter 2, this volume), education will be a critical component in assisting us as we make the quantum leap above the globalization wave. Education must meet the demands of the 21st century, yet this brief review of

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the values literature suggests that it must be sensitive to the values held by individuals and cultures to be effective or even accepted. Boko Haram and the Pakistani critics of Western education are unlikely to accept education that does not consider their ideals. In fact, the name Boko Haram is derived from a perfect example of this conflict of values. Newman (2013), a linguist, describes the etymology, citing Muhammad (1968; pp. 8–10):

... *boko* originally meant ‘Something (an idea or object) that involves a fraud or any form of deception’ and, by extension, the noun denoted ‘Any reading or writing which is not connected with Islam. The word is usually preceded with *Karatun* [lit. writing/studying of]. *Karatun Boko* therefore means the Western type of Education.’ To appreciate the semantic extension, one needs to understand that Western education introduced by the British colonial government in the early 1900s was not viewed with approbation. As compared with traditional Koranic learning, which was highly valued, western education was viewed as lacking in substance and a fraudulent deception being imposed upon the Hausa population by a conquering European force. Rather than send their own children to the British government schools, as demanded by the British, Hausa emirs and other elites often shifted the obligation onto their slaves and other subservients. The elite had no desire to send their children to school where the values and traditions of Hausa and Islamic traditional culture would be undermined and their children would be turned into ‘*yan boko*, i.e., (would-be) westerners.’ (pp. 7–8)

Although it may not be true of every North Korean, on average North Koreans exhibit strong hierarchy, mastery and embeddedness values, which are threatened by challenges to their strict social order. After decades of democratic (i.e., autonomous) rule, Hong Kong is being drawn into China’s embedded culture, with obvious discomfort. In order for education to be a positive force in addressing the macroproblems of the 21st century, we must consider how best to integrate what is to be learned with the values of those who will be learning.

Ambrose (chapter 2, this volume) lists 11 elements necessary for making the quantum leap. If these knowledge, skills and dispositions are, indeed, critical to success in the 21st century, they may be considered educational objectives. To avoid becoming *boko*, it is imperative that cultural and individual values be considered in designing the education that will achieve these objectives. Table 2 is a speculative list of cultural responses to these 11 elements based on Schwartz’s (2006) description of the cultural value dimensions of autonomy (intellectual and affective)/embeddedness, mastery/harmony, and hierarchy/egalitarianism. There is, as yet, no research on which to base these hypotheses, but they provide a starting point from which to begin the analysis that is needed in designing educational solutions to the macroproblems we face.

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Table 2. Hypothesized intersections among cultural values and 21st-century educational requirements

Cultural Values →	<i>Intellectual Autonomy</i> Encourages pursuit of one's own ideas and intellectual directions independently	<i>Affective Autonomy</i> Encourages pursuit of one's own affectively positive experiences	<i>Embeddedness</i> Individuals are part of the collective, gaining meaning through social relationships and identification with the group, sharing their way of life and working for shared goals.	<i>Mastery</i> Encourages individuals to master, direct, and change the natural and social environment to attain group or personal goals.	<i>Harmony</i> Encourages fitting into the world as it is, trying to understand and appreciate rather than to change, direct, or to exploit.	<i>Hierarchy</i> Encourages individuals to take on roles with unequal power within a hierarchical structure that supports production.	<i>Egalitarianism</i> Encourages all members to recognize one another as moral equals who work together for everyone's welfare.
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(Continued)

Table 2. (Continued)

Broad and Deep Proficiency in the Subject Areas	Will support proficiency in topics of one's choosing.	Will support proficiency in topics one desires to pursue (makes you happy).	Will support proficiency in topics that do not challenge the status quo or tradition or that do not disrupt the social fabric.	Will support proficiency when it allows mastery of nature or the social environment, particularly when done competitively.	Will support proficiency in areas that foster understanding and preservation of peace and the environment.	Powerful individuals or groups will get access to broad, deep proficiency. It will be encouraged when it maintains the hierarchy, but not when it is for the benefit of everyone.	Everyone will have access to the means to develop this kind of proficiency.
Creative Thinking Skills and Inquiry-Based Dispositions	Will encourage the independent, individual development of creative and inquiry dispositions.	Will encourage individuals to pursue these skills as they desire to do so.	Will encourage the learning of creative skills that are within the tradition of the culture. Unlikely to support innovation or questioning of the status quo.	Will encourage innovation and creativity that supports the mastery of nature or others. Competition and risk-taking will be rewarded.	Will encourage development of creative thinking skills and inquiry-based dispositions that are geared toward the preservation of the environment, peace and unity.	Creativity and innovation that support the hierarchy will be encouraged. People in command will be allowed to think creatively and ask questions; oppressed people will not.	Everyone will be encouraged to develop creative thinking skills and inquiry-based dispositions.

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Critical Thinking Skills and Dispositions	Individuals will be encouraged to develop critical thinking skills in order to ask questions that support their autonomy.	Individuals will be encouraged to develop critical thinking skills to pursue their interests.	Individuals will not be encouraged to think critically or to develop these skills, which will lead individuals to challenge the status quo and may disrupt in-group solidarity.	Individuals will be encouraged to think critically in order to master their environment. The ability to succeed by finding important patterns in complex data or questioning critically will be rewarded.	Individuals will be encouraged to think critically about issues that harm the natural or social environment in order to solve them and enhance harmony with nature and people.	Hierarchical societies that are embedded will not encourage the development of critical thinking skills. In autonomy-supporting societies, individuals in positions of dominance will be encouraged to think critically and develop these skills; others will not. Critical thinking that challenges the hierarchy will not be supported.	Everyone will have access to the development of these skills, but critical thinking that is supportive of the hierarchy may not be encouraged. Reaction will depend to some degree on the level of embeddedness that goes along with egalitarianism. Highly embedded societies that are egalitarian will want everyone to be able to think critically, but will not want critical thinking to be focused on individualism or personal gain.
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Table 2. (Continued)

Interdisciplinary Thinking	Individuals will be encouraged to explore multiple disciplines. Collaborations may suffer when individuals are too focused on their own autonomous intellectual pursuits.	Individuals will be encouraged to explore multiple disciplines, if they are interested in doing so.	Individuals may not be encouraged to explore multiple disciplines, because such explorations fall outside traditional methods. Disciplines may be closed to outsiders in such a society.	This may depend on whether the society is autonomy-supporting or embedded. If autonomy-supporting, mastery may be more likely to encourage competition than collaboration. If embedded, mastery of nature and society may serve ingroup goals and can happen effectively through interdisciplinary thinking.	Harmonious societies would welcome interdisciplinary collaborations that support peace and unity with nature, but not with goals of mastering nature or society.	A hierarchical society may demand that individuals work together to solve macroproblems, particularly an embedded one. An autonomous one may be challenged by a hierarchy among disciplines. Will individuals from a high- and low-status discipline be comfortable working together?	An egalitarian society would support interdisciplinary thinking that involves and benefits everyone.
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THE MACROPROBLEM OF CONFLICTING VALUES IN 21ST-CENTURY EDUCATION

Visual-Spatial Literacy	Will encourage the independent, individual development of visual-spatial literacy.	Will encourage individuals to pursue visual-spatial literacy as they desire to do so.	An embedded society would support development of visual-spatial literacy, except when it represents a nontraditional (i.e., threatening) approach. Insofar as it may be innovative, visual-spatial literacy may be rejected by embedded societies.	Mastery can be supported by developing visual-spatial literacy.	Harmony can also be supported by developing visual-spatial literacy.	Visual-spatial literacy could be supported by hierarchical societies, unless this makes it possible for dominated groups to better understand difficult concepts that could challenge the hierarchy.	An egalitarian society would want everyone to be able to understand difficult concepts, which could be made accessible through visual-spatial representations.
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Table 2. (Continued)

Information-Technology Skills	Intellectual autonomy is greatly enhanced by access to technology and the development of skills to make use of it. These societies will support the development of these skills.	Technology provides many pathways to pursue one's interests. These societies will encourage the development of information-technology skills.	The rapid changes associated with information technology may be challenging to the traditions that underpin embedded societies. Innovation may be threatening. Embedded societies may resist giving students access to technology.	Mastery of both nature and society will be facilitated by information-technology skills.	Harmony with nature and others can also be facilitated by information-technology skills.	Hierarchical societies will preserve information-technology skills for those in power or authority or with the means to afford the technology.	Egalitarian societies will encourage all members to develop these skills.
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THE MACROPROBLEM OF CONFLICTING VALUES IN 21ST-CENTURY EDUCATION

Financial, Business, Economic, and Entrepreneurial Acumen	These societies will encourage the development of skills in finance, etc., which will require intellectual pursuit outside the traditional boundaries.	These societies will encourage the development of skills in finance, etc., which will allow individuals to pursue financial and business opportunities as they desire.	Financial, Business, Economic, and Entrepreneurial Acumen will be put to use for the good of social relations and shared goals. It will be challenging for members of these societies to be quick to respond to new situations when tradition and order are so highly valued. Innovation and risk-taking may disrupt solidarity and the status quo.	Financial, Business, Economic, and Entrepreneurial skills, which will be highly prized.	Mastery of nature and others can be achieved with Financial, Business, Economic, and Entrepreneurial skills, which will be highly prized.	Harmonious societies may encourage development of these skills. Finance and business may be about mastering your environment, not living in peace with it. However, money is necessary for everyone's well-being and maybe for preserving the environment, so perhaps these skills will be encouraged. Everyone needs a career.	These skills are needed to maintain the hierarchy and their development will be encouraged. They will, however, be reserved for those in power.	Egalitarians will want all members of the society to be able to respond to the changing tides and to be cared for. They will encourage the development of these skills.
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Table 2. (Continued)

Intrapersonal Self-Discovery and a Sense of Purpose	These societies will encourage individuals to explore various intellectual pathways to self-discovery. Individuals will have multiple opportunities to find a purpose.	These societies will encourage individuals to explore various pathways to self-discovery that result in self-fulfillment.	Embedded societies are not concerned with self-discovery and will let you know what your purpose is based on tradition or available social roles.	Mastery societies will encourage their members to have a purpose of achievement and to master, direct and change their environment. Talents and passions that serve this purpose will be fostered.	Harmonious societies will encourage self-discovery and a purpose of understanding, appreciating, and working for the benefit of nature and others.	Opportunities for self-discovery will be reserved for the dominant group.	Everyone will be encouraged to find their innate talents and pursue their passions. The purposes encouraged in this society will be supportive of egalitarian ideals.
Cognitive Diversity	Cognitive diversity will be supported, but may take a back seat to individuals' intellectual pursuits.	Cognitive diversity that is comfortable, pleasurable, will be supported. Cognitive diversity among conflicting participants may be unpleasant, hence avoided.	Cognitive diversity will not be valued in an embedded society.	Where useful nature and others, cognitive diversity will be supported.	Where useful for building harmony with nature and others, cognitive diversity will be supported.	Acceptable cognitive diversity will be among those supportive of the hierarchy. Opportunities for true diversity will be limited.	Not only will cognitive diversity be supported, all participants will also be viewed as equal.

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Interpersonal Ability, Collaborative Skill, and Leadership	Individuals may be encouraged to develop these skills.	Individuals may be encouraged to develop these skills, if they are interested.	These are critical skills for working effectively in an embedded society and will be supported.	These are useful skills for achieving mastery goals and will be supported.	These skills are also useful for developing harmonious relationships with nature and society and will be supported.	These are useful skills in maintaining the hierarchy and will be supported. The goal will be to work effectively within the hierarchy.	These are important skills for working together in an egalitarian society and will be supported. The goal will be to use these skills for the good of all members.
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Table 2. (Continued)

Ethical Insight, Global and Multicultural Awareness, and Personal and Social Responsibility	Global and multicultural awareness are in keeping with intellectual autonomy and will be supported. Personal and social responsibilities are to maximize one's own potential. Ethical insight is to pursue one's own intellectual interests.	Global and multicultural awareness are not necessarily important for affective autonomy. Personal and social responsibilities are to pursue one's own interests. Ethical insight is to pursue what makes you happy.	An embedded society is built on social relationships, but the need for awareness of others may not extend to the outgroup. One's personal and social responsibility is to the ingroup. Ethical insight is based on one's roles and responsibilities within the society.	Global and multicultural awareness are useful in mastering these relationships and nature. Personal and social responsibility will vary depending on autonomy/embeddedness of the society. What you should be mastering and how to go about it depend on whether you are expected to pursue your own or the group's goals. Ethical insight is that you/people should master your/their environment.	Harmony depends on a global and multicultural awareness. Personal and social responsibilities are to understand, appreciate, and serve nature and harmonious relationships. Ethical insight is that we can/should live in harmony with nature and others.	Global and multicultural awareness are necessary to maintain the hierarchy. Without awareness, threats to the social structure may destroy it. The perspective in teaching awareness will be on the threat to the hierarchy. Ethical insight is that hierarchical relationships are legitimate and should be maintained.	Global and multicultural awareness are important, because all cultures across the globe are seen as equal. The perspective in teaching awareness will be on the welfare of all. Ethical insight is that people are equal and equally deserving of rights and opportunities, and should share equally in the responsibilities necessary to make the quantum leap.
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Note: Cultural values are from Schwartz (2006, pp. 140–141); Educational requirements from Ambrose (chapter 2, this volume)

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Western education may be anathema to some cultural groups, but if it is to be useful in effecting positive change in the 21st century, it is critical to keep in mind the findings of Fischer and Schwartz (2012). Despite the values Schwartz (2006) identified from aggregated scores of individuals within countries, Fischer and Schwartz's analysis indicates that individuals within those countries may have widely disparate values. Schwartz acknowledged this when he included separate analyses for Israeli Arabs and Jews, Anglo and French-speaking Canadians, and East and West Germans. The US may, on average, be affectively autonomous, mastery, and hierarchically oriented, but that value system does not describe many Americans, as the regular Congressional stand-offs between Democrats and Republicans illustrate. Fischer and Schwartz found that autonomy and benevolence were highly valued by individuals in nearly every sample. Appealing to values of autonomy and benevolence may be effective, but care must be taken not to threaten the social fabric in embedded cultures.

CONCLUSION

Haidt (2013) put it well: "Morality binds and blinds" (p. 292). Cultural values bind individuals together and blind them to evidence that contradicts the values they hold. Presenting his reply to Haidt's research at the 2012 conference of the Association for Moral Education, Blum (2013) claimed emphatically that Haidt was wrong to suggest that conservative and liberal values are equally "worthy," going so far as to suggest that conservatives may be basing their morality on "false assumptions, factual ignorance, delusion, self-misunderstandings, ideological distortions and confusion" (p. 310). A conviction that one's values are correct and others' values are incorrect or unworthy is the basis for many of the conflicts evidenced in the news stories related at the beginning of this chapter. Even Kohlberg's (1969) stages of moral development culminate with a distinct value of universalism and benevolence, an ordering with which some individuals would disagree (i.e., Lakoff's [1996] Strict Father moralizers, who place the highest priority on strength). How can two individuals, much less entire societies, collaborate from such disparate perspectives as those who believe in strength over nurturance or security and conformity over self-direction or universalism and benevolence over achievement and power?

In his analysis of current events in Russia and the US, Gray (2014) quoted President Barack Obama, who declared, "by absorbing Crimea into Russia... Russian president Vladimir Putin was putting himself 'on the wrong side of history'" (p. 38). This belief – that history favors liberal values of democratization and egalitarianism – is another example of the blinding force of one's values. As Putin has dramatically reasserted Russia's claim to power, Western leaders must recognize the values that are at play. "Most human beings in every society, much of the time, care about other things more than they care about being free. Many will vote readily for an illiberal government if it promises security against violence or hardship, protects a way of life to which they are attached, and denies freedom to people they hate. Today, these

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truisms belong in the category of forbidden thoughts” (Gray, 2014, p. 43). Liberal values predominate among liberals, but there are many other value orientations in the world, each with strong adherents.

We all have values, our preferred “end-states of existence” (Rokeach, 1968–1969, p. 550). Those values that aid in our survival and group welfare (Schwartz & Bilsky, 1987) are worth transmitting. When other individuals or cultures do this differently, it is important to understand the foundations of their choices. We may want to relieve suffering around the world as we move into the 21st century. However, what one person views as suffering may not be experienced that way by another. Shweder (2008) writes, “To suffer is to experience a disvalued and unwanted state of mind, body, or spirit” (p. 71). Can we determine the value or desire others have for different states of mind, body or spirit? An in-depth analysis of cultural and individual values is necessary to understand reasoning about macroproblems and macro-opportunities. Conflict occurs when a group’s survival or welfare is threatened and globalization comes with threats on an enormous scale. As we learn to work together toward the success envisioned in the Catch a Wave model (Ambrose, chapter 2, this volume), understanding and appreciating one another’s values is essential.

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8. THE HOBBSIAN TRAP IN CONTEMPORARY INDIA AND SOUTH KOREA

Implications for Education in the 21st Century

In this commentary to Ambrose's focus chapter on "21st Century Contextual Influences on the Life Trajectories of the Gifted, Talented and Creative", we examine the socioeconomic, cultural and ideological constraints to development in education and society in India and Korea, with a particular focus on issues that fall through the cracks and segments of society that get left behind. In spite of the phenomenal economic growth in these countries and advances at the frontiers of technology (e.g., the success of the 2014 India's Mars mission; the information-technology sector in Korea), educational opportunities are still mired within a socioeconomic and cultural context that hinders opportunities for young people. Ideology and social Darwinism in the 21st century play a role in both countries, to a lesser extent in Korea where a homogeneous society and a smaller albeit dense population has been able to reap some of the benefits of socioeconomic and technological advances. We chose these two countries because they offer interesting points of contrast with respect to economic development in Asia. In this commentary to Ambrose's chapter, the Darwinian nature and constraints of educational opportunities in these countries is examined as framed within the macro-context of historical forces that shaped the structure of society in these countries, particularly cultural ideology that creates a Hobbesian trap.

Indian and Korean societies have a very long tradition of learning that is historically steeped in religious traditions. Religious texts like the Vedas and Upanishads laid the foundation of an oral tradition of knowledge transmission in India (Kosambi, 1966; Sriraman & Benesch, 2004). Similarly in Korea, Confucian and Buddhist texts played a major role in the foundations of society. In both societies learning was revered and the role of a "teacher" in the passing of knowledge was central. Colonialism played a major role in both societies in the transmutation of traditional learning centers into institutions of learning (namely schools) that mimicked the educational system in England and China respectively, more so in the case of India as seen in the use of English in higher education since independence in 1947 after 250 years of British rule.

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In the case of Korea, the influence of Chinese culture for more than 1600 years (since the 4th century AD) affected the structure of society and to a lesser extent the Japanese who colonized it after the Sino-Japanese and Russo-Japanese wars in the period 1894–1910. Korea was a Japanese colony until 1945. Korean society is steeped in Confucianism- that is, a philosophy that underlies behavioral norms in human relationships, considered as “good” for the proper functioning of society. Confucianism originated in China and permeated both Japanese and Korean societies and ways of thinking. The writings of Confucius (551–479 BCE) were a system of morals and ethics in order to create a citizenry that was moral and worked for the general good of society. Confucianism also influenced the educational systems, with competitive exams forming the basis for selection of the best people for administrative positions in the existing bureaucratic and governance structures. Confucianism, when viewed through the lens of the West, can seem paradoxical. For instance, a Korean student, who might seem self-assertive in front of his or her peers, would appear demure among elderly relatives. In comparison to Japan, where Confucianism trickled into imperial circles in the early 1600’s and subsequently was tweaked to suit nationalistic purposes, Korean society adopted it much earlier, as the very basis of the philosophy of the Yi dynasty (1392–1910). The Yi dynasty developed it as a basis of morality, emphasizing filial piety and ensuring that it permeated all levels of society (Paik, 2001).

Regardless of colonialism, both Indian and Korean societies were historically anchored in a teacher-student tradition of learning, with students from the higher castes in India and higher societal standing (aristocracy) in the case of Korea benefitting from the imparted knowledge. In India, schooling perpetuated the caste-based status quo of learners from higher castes replicating and filling societal positions that required knowledge of the scriptures or skills necessary for governance. In the latter case (Korea), the Confucian model provided access to those with higher socioeconomic standing to allow their children to benefit from reading, writing, and the skills required for bureaucratic positions in the system in place. In both cases, exams played a major role in the selection of the “best” students for existing positions in society, namely administrative positions. Thus institutionalized learning historically had an exchange value in both these societies. In ancient times it was viewed by the elite as a necessary means to preserve the structure and order of society, and in modern times in the access that exams provide to educational opportunities in economically profitable sectors.

We now examine the quantum leap that has occurred in both India and Korea and then examine the Hobbesian trap that has resulted within their respective historical and cultural frameworks. In other words, have macro-opportunities arising from globalization resulted in the advancement of these societies or only perpetuated the historical status quo in new garb?

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THE NATURE OF THE QUANTUM LEAP

The Indian Milieu

According to the Ambrosian “Catch a Wave” model, societies that successfully catch the 21st century globalization wave are those that pay heed to long-term socioeconomic and political problems that can arise when major changes occur within existing structures. India, a country with more than 1.3 billion people provides an extreme case to highlight the salient features of the model.

Since its independence from British rule in 1947, India was besieged by 5-year long-term development plans partly based on the socialist model of the Soviet Union. Under the Congress political party rule for the majority of its existence since 1947, bureaucratic governmental structures hindered free-market competition and entrepreneurship while conferring benefits to a few industrial families under whom monopolies prevailed (Khilnani, 1999; Sen, 2005). This resulted in a massive brain drain from the 1970’s onwards of Indian students moving to the west for postgraduate opportunities and never returning to their home country. Two decades later, there was an unexpected and tremendous surge in the Indian economy. In the early 1990’s the Central (federal) government moved to privatize the industrial and economic structure resulting in the model of the market economy replacing the neo-Socialistic bureaucratic structure that was in place. The appearance of a freer market and relaxed governmental restrictions on private initiatives resulted in a surge of entrepreneurship and rapid economic growth especially in the urban areas of India.

A corresponding “surge” occurred in the educational sector, where numerous private colleges and universities were set up to meet the demands of the growing middle class. Formerly, the “wards” of the middle class and even the gentry who could not make the stringent cut-offs for government subsidized universities in the competitive fields of medicine, engineering, and computer science, now had access to newly accredited institutions for a price. A university degree from a lesser institution also provided the exchange value of a job and in many cases access to higher education in the West, particularly because students benefited from an English medium of instruction. In other words competition in a Darwinian sense had been replaced by wealth as a commodity of exchange for economic success through education.

The Ambrosian “quantum” leap suggested in the “Catch a wave” model occurred for a particular segment of society that was able to benefit from changes to the socioeconomic structure in place. Unfortunately the segment that benefited was already poised for the leap in a generational sense. Parents who somehow had the benefits of an education and/or access to wealth were able to access opportunities for their children. On a more positive note, the privatization of the economy and the educational sector that started in the 1990’s in India, and the increased wealth of the

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middle class had the “trickle-down effect” of the importance of education as a means of upward mobility. In the ensuing two decades, globalization and information technology brought an unparalleled awareness to the masses in the rural landscapes of India of the inequities in the system, and resulted in grassroots political and social movements to protect the interests of small farmers from exploitation by middle men who engaged in price fixing on behalf of larger firms. Initiatives such as biometric identification of individuals, including those who were disenfranchised in rural areas, have reduced instances of voting fraud and rigged elections. Digital media has made it more difficult for corrupt politicians to continue their practices because of the likelihood of being caught on the record. Unfortunately, the prevailing dogma of caste and religion versus the advances in technology and science has left in its Hobbesian trap a very large segment of society that needed to be uplifted in the form of access to basic infrastructure like shelter, food and sanitation (Gupta, 2000). The paradox of India is evident to any visitor who comes to its cities and finds a juxtaposition of state of the art technology and high-rise corporate life with the mortar-brick and slum like existence of nearly 90% of the masses.

The Korean Milieu

Korea offers an interesting contrast to India for consideration in the Ambrosian model. Korea industrialized rapidly in the last four decades to become an economic powerhouse in the areas of shipbuilding, information technology, and the automobile industry. To get a better sense of the phenomenal economic growth of Korea,¹ a key benchmark to note around 1970 was the \$200 annual per capita income, with inadequate infrastructure to train teachers and support schools (Sorensen, 1994). At that point in time, agrarian communities still relied on children as a source of support for work on farms and other small-scale industries. The “quantum” leap for Korea occurred in the ensuing forty years and is evident in progress indicators such as the rise of its per-capita GDP to \$32,000, membership in the OECD and the G-20 economies, and more importantly its students becoming the highest achievers in the OECD administered Programme for International Student Assessment (PISA) in reading, mathematics, and science.

What can explain such a turnaround? According to Shin (2012), a distinguishing feature of Korean higher education “is that its growth has been closely related to economic development. Government policy has promoted this relationship... [i]n 1961, it established a long-term plan with economic development as its primary focus” (p. 68). Further Shin posited distinctive attributes of the Korean quantum leap as the Confucian tradition, Western university ideas, and economic development (p. 69). More importantly, the strategic vision of the government foresaw the changing needs of the globalized world by developing key sectors of industry such as shipping, automobiles, and information technology as integral parts of today’s knowledge economy. What remained unsaid in the Korean success story were the sacrifices made by the previous generations for today’s prosperity, and

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the consequences in terms of changes in the structure of society that have occurred. These are examined in the next section.

OVERVIEW OF 21ST CENTURY PROBLEMS AND PROGRESS IN INDIA AND KOREA

The Hobbes Trap in Modern India

In the context of education, as alluded to earlier, the system in place has undergone numerous changes over the last two centuries. The modern system of education is a byproduct of English colonization that has more or less preserved caste-based status quos. According to Naik (1977), formal systems of education in place have more or less ignored informal or vocational or apprentice-based systems in place. The latter include those that engage in trades and crafts such as woodworking, pottery, spinning and weaving, and metal work, which traditionally have been the purview of the lower castes. Some estimates from the Indian ministry of labor place 420 million out of 450 million employed people as fitting into this informal knowledge-based system (MOLE, 2009). The number is particularly staggering when it implies that 1 in 3 people are educated in an informal knowledge-based system that relies on an apprenticeship-based (and very often indentured) mode of education. While the rest of the world makes assumptions about the caliber of Indian university education based on notable scientists, information technologists, and entrepreneurs who have benefitted from the formal systems in place, the Hobbesian trap contains nearly one third of the population who do not benefit from the leap because their system has been left largely unacknowledged! In developed countries such a large labor force typically has the protection of accredited vocational institutions and labor laws to stipulate working conditions and ensure a minimum wage to prevent exploitation. However, in India this huge segment of the population consisting of the lower castes has again fallen victim to the historical caste-based system. Naik's (1975) writings have elements of Paolo Freire's notion of emancipatory education as a means of liberating the masses from the cycles of oppression. In this sense education is conferred a political status. The present-day situation in India reveals a post-colonial landscape where members of the educated elite impose western ideals and western notions of formal education that do not adequately work for the informally educated masses. However, what it does is preserve age-old caste based structures.

The flaw in the educational system is that it does not allow individuals from lower socioeconomic backgrounds entry into it because the system is more or less linear and assumes everyone has the access and resources to be in school for a fixed period of time to procure the necessary certificates to advance to the next stage. In many ways it is reminiscent of the prevalent middle-class myth in the United States that education provides upward social mobility and is a means of liberation from poverty, when in fact the children of those living in conditions of poverty very often are victims of under-resourced public schools and neighborhood conditions

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that perpetuate crime, addiction, and other social problems. Analogously Ambrose's chapter uses the phrase "educational apartheid" to point to the creative intelligence gap occurring in the American education system along with the entrapment of millions of deprived young people in the Hobbes trap.

Globalization resulted in an unprecedented scale of urbanization in India due to job opportunities created via outsourcing that included call centers, information technology campuses, and conglomerates. Unchecked urbanization also resulted in congestion, slums, and an extremely competitive work environment. This in turn has led to increased suicide rates in both males and females, in addition to crimes against women. Andres et al. (2014) report that, in India, over 100,000 people commit suicide each year, thus contributing to 10% of global suicide deaths. There has been no national legislation to address this problem.

The Hobbes Trap in Modern Korea

In comparison to India, which has a very large segment of its population in the Hobbesian trap but poised to make a quantum leap, Korea caught the 21st-century globalization wave and has been successful in improving the socioeconomic and educational status of much of its population, as is evident in its G-20 economic standing and success in the OECD administered PISA. Unlike India, Korea is relatively homogenous culturally and linguistically, with governance that has taken into account long-term development. The question then is: Has the success dimension nevertheless created a Hobbesian trap due to unanticipated societal problems? We examine this issue in this section.

The Confucian heritage of Korean society places a very high emphasis on education and conforming to the rules. In fact, the exchange value of higher education at the top universities in Korea is placed at such a premium that it has created an obsession with garnering perfect scores on college entrance examinations (the CSAT). Private after-school programs cater to this national obsession starting from the elementary years.

Burnout of students by the time they reach college is revealed in morbidity statistics such as increased suicides. An article appearing in the Asia Times in 2005 stated that more than 1,000 student deaths occurred from 2000 to 2003 (Card, 2005). The modern-day legacy for education in Korea is the obsession of students to perform well on the highly competitive college entrance exams for the limited number of seats in the science and engineering tracks at the top universities in the country. Entry into one of the top three universities is synonymous with setting a life trajectory that ensures upward social mobility.

The tension and contradiction within this system is apparent in the fact that, although Korean society values education, the examination system is highly constrictive, inhibits creativity, and invariably is used to stratify society in general. Political analysts question whether the economic growth in Korea has come at the

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expense of democracy (Im, 2011). For instance, the basic democratic tenet “rule of law” underwent a Confucian interpretation by the post 1987 Lee Myung Bak government to mean “strict application of laws without exception, firm enforcement, and voluntary obeisance to laws...[n]othing about protecting citizens’ rights through law or about protecting human rights” (Im, 2011, p. 581). For a country that claims to be fully democratic, Im (2011) further pointed out, there is a lack of accountability in elected officials, the presence of corruption, curtailment of civil liberties, and lack of the freedom of press.

More worrying, the East Asian financial crisis of 1997 triggered a polarization of the economy, with disintegration of the middle class to create an hourglass shaped economic demographic analogous to that of the United States. Im (2011) further argues that economic polarization in turn leads to educational polarization, with the elite benefitting most from access to the right resources. In a country where private educational services starting from the elementary-school level shape the educational futures of students, an extreme economic cost is imposed on families. The term “seagull” dads is used to denote the phenomenon of one parent (typically the mother) living with the student in an English speaking country to help them adjust to their transition, while the father provides all the financial support to them (Lee, 2011). In an article in the Washington Post, Ly (2005) reported on the devastation that occurs in families, which includes marital strife, drug abuse, and even suicide when education abroad is made a priority over everything else. As of 2006, there were over 28000 younger students (elementary, middle and high school) abroad and an estimated 10,000 seagull dads² (Oh, 2008).

In spite of the rose-colored glasses through which the world views the Korean success story, the Hobbesian trap has left in its wake an expedient and undemocratic interpretation of Confucianism, a vanishing middle class, increased suicide rates among adolescents, and family structures with one absent parent (“seagull” Dads). Thus the quantum leap that occurred for the present generation of Korean university students has come at a tremendous sacrifice made by the previous generation.

CONCLUDING REMARKS

In this commentary we used the Ambrosian “Catch a Wave” model to macroscopically analyze the impact of globalization in India and Korea in relation to changes in education and society. Our analysis relied on situating globalization in these countries within their historical and cultural pasts. Even though these two countries are quite different in terms of the forces that shaped their quantum leaps, India with its sub-continental landmass, British neo-colonial past, and a heterogeneous population, and Korea with its Sino-Japanese colonial past and a homogeneous Confucian heritage, in both countries education has held an exchange value (as a commodity) for social mobility. In addition, in both countries the “westernization” of the educational system has served to preserve the status quo for the elite. In the case of India it

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has served higher castes and the industrial elite. In the case of Korea it has served the traditional aristocracy and the industrial elite, both advantageously poised for changes in society. Even though the wave of globalization created educational opportunities for the middle class in both countries, it has left in its Hobbesian wake segments of the population and societal issues that need to be confronted despite the cosmetic success seen from the outside by the rest of the world.

We have so far brought to light major issues within their respective historical and cultural frameworks. In doing so, we have paid particular attention to historical forces and cultural ideologies that shape the Hobbes' trap for these countries caught up in the wave of success that inadvertently extracts a cost on segments of its population. Education in both these countries needs to be re-examined with respect to their "societal health" to prevent disenfranchisement of segments of its population that will contribute to long-term major societal problems. Socioeconomic gains for any country cannot come at the expense of disenfranchisement since history has shown us repeatedly that it results in societal or civilizational collapse (Sen, 2005).

The political landscape in India changed in 2014 with a landslide victory for the Bharatiya Janata Party (BJP), a relatively "right-wing" party in comparison to the entrenched Congress Party that held political sway over post-Independence India. The BJP under the leadership of the current Prime minister Narendra Modi has recently enacted major neoliberal reforms modeled on his successful economic development in the State of Gujarat (Tommaso, 2012). The aim of this neoliberal agenda is to use the emerging demographic dividend,³ to propel the economy. However this agenda is viewed with skepticism since the labor force within the demographic dividend consists largely of socioeconomically disadvantaged people that still live in poverty.⁴ The challenge for the BJP is not only to provide basic infrastructure to this segment of the population but also to provide educational opportunities. This would make more macro-opportunities available to a better-educated demographic dividend and enable them to make the quantum leap without falling into Hobbes' trap.

In a contrasting vein the challenge for Korea is to prevent the runaway economic success story from hiding significant macroproblems that have been discussed in this chapter. Suicide is a major social issue in Korea with the country ranked as high as 2nd by the World Health Organization in terms of rates.⁵ The steadily rising rates since 2000, in the wake of the 1997 financial crisis are attributable to a highly competitive academic and social atmosphere and receding Confucian values. University education long seen as the shibboleth of success is being questioned since the needs of the present society also require vocational skills that do not require university education. The government has shown a new interest in promoting vocational schools as an avenue for success as opposed to the traditional university education trajectory. Psychological problems that traditionally have been viewed as a "character weakness" are also being re-examined from a modern standpoint as the effects of social and economic stressors on day-to-day life. Korea's macroproblems

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have been the result of abandoning Confucian values without the social nets required for adjusting to the demands of “western” modernity. The challenge for Korean society in the 21st century is to re-examine its quantum leap from the standpoint of the macroproblems that have arisen from its rush to capitalize on macro-opportunities afforded by globalization.

In conclusion, we have provided two examples to help illustrate the “Catch a wave” model that stand in sharp contrast to each other: India that is poised to catch the wave of macro opportunities on a much larger scale but confronted by social problems that need to be addressed in order to avoid the Hobbesian trap, and Korea which already caught the wave of macro-opportunities and now needs to address the Hobbesian traps.

NOTES

- ¹ By Korea, we refer to South Korea.
- ² Families with one absent parent, usually the father who stays in Korea, and supports the family financially.
- ³ Demographic dividend is defined as having a significantly larger proportion of people in the working age category in comparison to those over 65.
- ⁴ India's population in 2050: extreme projections demand extreme actions, by Ranjit Goswami, <http://www.eastasiaforum.org/2013/04/05/indias-population-in-2050-extreme-projections-demand-extreme-action/>
- ⁵ Suicide Rates by Country, Global Health Observatory Data Repository. January 1, 2012. Accessed July 22, 2015.

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9. HIGH ACHIEVING DEPRIVED YOUNG PEOPLE FACING THE CHALLENGES OF THE 21ST CENTURY

The 21st century is shaped by a complex set of factors, and is driven by multiple dynamics. The unsettled world we see today configures a global landscape facing increasing challenges involving global conflict, energy problems, environmental change, food and water insecurity, demographic trends, regional economic connectivity, transnational crimes, as well as border movements (see the focus chapter of this volume, Ambrose, chapter 2, this volume). Economic and population growth are leading to an increasing demand for fewer resources. Moreover, the problems that unequal societies face affect people in all levels of society, in terms of their social lives, and their mental and physical health, as Wilkinson and Pickett (2009) stated. Furthermore, the increasing traditional and non-traditional security challenges are leading nations to strengthen their policy planning at political, economic and military levels.

In the past decade, Latin America and the Caribbean region have achieved impressive social and economic successes, exhibiting for the first time in history, more people in the middle class than in poverty. Moreover, inequality declined markedly, although it is still high. Growth, jobs and effective social programs have transformed the lives of millions. And the region has shown it is better prepared to face the global economic slowdown. Actually, the region faces the challenge of maintaining its gains in an adverse context of low growth. Under this scenario, achieving development results, and learning from them, becomes of the utmost importance (World Bank, 2015).

Latin America and the Caribbean together with East-Central and Southeast Europe are the Bertelsmann Transformation Index (2014) regions that broadly adhere to the guiding principles of democracy constituted under the rule of law and a market economy equipped with sociopolitical corrective measures. Although not all Latin American countries are democratic, many countries in Latin America and the Caribbean recently have taken steps forward in consolidating democracy and the market economy, although a few, such as Venezuela, have taken steps backward. Compared with Europe or North America, democracy in Latin America struggles against big obstacles, including poverty, income inequality, and corruption (Zovatto, 2014). Poor institutional design is also considered a significant problem (The Economist, 2015). Moreover, problems such as high levels of social inequality, the fixation on commodity exports and the incongruity between social demands and

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the responsiveness of the political system still remain (Transformation Index BTI, 2014). Mapping the future is difficult, and long-term effects remain uncertain. The constant factor in the 21st century is change, and it is necessary to analyze how change will impact future generations.

Gifted and talented young people living under conditions of deprivation around the world usually belong to underserved populations. In Latin America and the Caribbean region, this situation is enhanced by the broad ethno-linguistic diversity (Blumen, 2007, 2008). Gifted and talented young people are often exposed to constant change, need to adapt to extreme living conditions and, depending on their countries of origin, they tend to face different types of social and economic inequities. This situation worsens when they belong to multicultural ethnic-linguistic diverse emerging countries that remain fragmented along the lines of culture, economics, geography, politics, gender, health, and educational opportunity. There are huge gaps between social strata and across the urban-rural divide, with indigenous communities especially marginalized (Transformation Index BTI, 2014).

SOCIOECONOMIC INEQUITY AND ITS EFFECTS ON HIGH-ACHIEVING YOUTHS

In Latin American and Caribbean contemporary societies with heavy indigenous presence school attendance is mandatory from 5 to 17 years of age in most of the countries. However, good quality education is often related to the social and economic status of the family. Gaps between the quality of public and private education are significant, with private education better than public education in this particular region. Experts are hesitant to use the concept of *giftedness*, as it is generally related to those that succeed due to their access to high-quality education, rather than the majority of children living in poverty conditions, often failing in the educational system. Given that *giftedness* is a social construct, there is no one-size-fits-all conception of giftedness (Sternberg, 2007). From a cultural perspective, giftedness is influenced by cultural beliefs, needs, values, concepts, attitudes, and language (Bevan-Brown, 2011; Blumen, 2011).

However, from the policymakers' perspective, in order to establish a formal state platform to serve the needs of those who surpass others in the academic domains in Andean countries, it is better to focus attention on the concept of *high achievers* than on the term *gifted children*. High achievement as a concept tends to be more related to cognitive and conative factors, academic ability, self-regulation, as well as access to opportunities (Alencar, Blumen, & Castellanos, 2000; Blumen, 2009; Mönks, Ypenburg, & Blumen, 1997). This leads to a better understanding of those who exhibit an excellent performance in certain domains, becoming better accepted than the so-called *gifted* by the general population. Other significant factors in the conception of *high achievement* involve: (a) the development of expertise through training and interventions in domain-specific skills, (b) self-regulated thinking

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to achieve levels of expertise (Alencar & Blumen, 2002), and (c) outstanding performance in adulthood (Subotnik & Rickoff, 2010).

In Latin America and the Caribbean countries, provisions for high achievers involve a variety of possibilities, from upper-middle-class urban high achieving youths attending International Baccalaureate (IB) private schools to lower-middle-class students competing for a place in the public programs for academically high achievers. Among Latin American and Caribbean countries, Brazil and Peru are leading the state-funded provisions for underprivileged high achieving youths (Blumen, 2013). In Brazil, a country committed to supporting their gifted children and youth for more than 30 years, the term *gifted* is widely used. However, in Peru the governmental staff members prefer the term *high achievers* (Pronabec, 2015). Peru also has become a strong supporter of gifted youths living under poverty conditions since the beginning of the millennium (Blumen, 2012a, 2013), exhibiting positive results in international competitions: ranking 16th at the International Math Olympiads (IMO, 2015), 19th at the Chess Olympiad (41st Olympiad Tromso 2014 Open, 2014), as well as 11th in athletics at the 2015 Pan-American Games (Pan American Games, 2015).

It seems that the need to overcome the limitations of poverty conditions drive resilient gifted and talented children and youth until they reach their goal, although some of them cannot reach goals due to the deprivation in which they live. Given the presence of extended family relations in the Latin American region, in the case-analysis of high achieving youths that succeeded in Peru (Blumen, 2012b, 2013a) one can always find a mother (poor families tend to be mono-parental), a godfather, or a mentor, who became the role-model and the affective supporter of the high achieving youth. The following analysis of high achieving deprived young people in Peru is presented as an example of a Latin American society that has overcome dramatic levels of inflation, as well as the horrors of an armed conflict during the 1980's. This analysis aims to contribute to the understanding of high-achieving youths who are developing in multicultural transition countries that are at least partly pacified.

PERU: HIGH-ACHIEVING DEPRIVED YOUTHS OVERCOMING POVERTY THROUGH EDUCATION

Peru, an ethnic-linguistic diverse and multicultural country, is the third-largest country in South America. Peru has achieved a high degree of educational coverage and gender equity compared to similar areas of Latin America with heavy indigenous presence (Transformation Index BTI, 2014; World Bank, 2007). However, education and training facilities vary widely in terms of quality. Primary education enrollment and completion rates for marginalized urban and rural youth are high, but the quality of public education is still low, constituting a barrier to further development in other areas. Per capita expenditures in the primary education system are among the lowest

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in the region, around 3% gross domestic product. In 2006, the National Education Project [*Proyecto Educativo Nacional/PEN*] was started to establish long-term priorities in education. The first evaluation of the PEN, done in 2011, showed that both the quality of general education and gender equity had improved. However, the Peruvian quality of education was still behind international levels, due to the following factors: (a) differences between socioeconomic status groups remained; (b) decentralization and social participation needed to be promoted; and (c) the tertiary education system exhibited low quality, with relatively few internationally accredited programs.

Services for high achievers throughout Peruvian history were marked by the preferences of those who determined its political destiny during the different historical eras (Blumen & Cornejo, 2006). At the beginning of the Republican Era, Ramón Castilla (1797–1867) developed the first official proposal to identify the most talented college students, granting them support to study either in England or France. However, the systematic exclusion of the native population remained.

Since 1837, the educational system in Peru, run by the Ministry of Education, has used a central system style. Education is compulsory from Kindergarten to 11th grade, which marks the end of the Secondary level, at 17 years of age. Academically, high achievers coming from deprived conditions usually are awarded fellowships to continue their studies in all public and some private universities. The Ministry of Education (Ministerio de Educación, 1983) formulates, implements, and supervises the national educational policy of the country.

From the 19th century to the 20th century, conceptions of giftedness in Peru were associated with geniality, as an innate quality of an individual that needed to be identified (Alencar, Blumen, & Castellanos, 2000). By the end of the 1980's, the conception of high ability or giftedness was consistently used primarily in reference to general intelligence (*g*), in the policies and practices given by the Ministerio de Educación (1983). However, research findings and initiatives coming from scientific settings (Alencar, 2008; Blumen, 2009; Mönks, Ypenburg, & Blumen, 1997; Robinson, 2006) revealed that factors such as access to opportunities, motivation, self-regulation, and perseverance, were also important to consider. Moreover, the development of expertise involves training and interventions in domain-specific skills (Alencar, 2008), as well as self-regulated thinking to achieve levels of expertise and outstanding performance in adulthood (Subotnik & Rickoff, 2010). But, the lack of culturally fitted foundations for establishing provisions for those who surpassed others in academic achievement and other domains, as well as the inability to identify who will be the eminent adults in the future, restrained policies related to the identification of the highly able in the community until 2009 (Blumen, 2012a, 2013).

In 1983, the Ministry of Education of Peru launched an Educational Law recognizing and defining the gifted individual as "...the special girl or boy that exhibits high abilities that significantly surpasses the normal level of intellectual functioning, and needs special programs in different modalities..." (Ministerio de

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Educación, 1983). The definition was focused on cognitive skills, and academic achievement, relating to the intellectually gifted child. This norm: (a) promoted advocacy toward the needs of the gifted and talented guided by considerations of gender equity; (b) underlined the importance of identification services and talent development provisions in the educational setting; and (c) established the foundations for teacher training programs, and psycho-educational provisions in and out of school settings (Blumen, 2014; Gonzales, 1991; Pereyra, 1987).

For the past three decades, the Psychology Program of the Pontificia Universidad Católica del Perú together with the Centrum voor Begaaftheidsonderzoek (CBO) [Center for the Study of Giftedness] at Radboud University, under the then leadership of Professor Franz Mönks, created a laboratory with different initiatives. This effort was proposed in order to support the improvement of Peruvian competitiveness and to promote international accreditation processes (Blumen, 2012b; Crea Talentum, 2015). When the need to promote the development of creativity in the school setting was underlined from the podium of the First Conference on Creativity, Technology, and Talent in 1994, held at the PUCP, the idea was adopted by Peruvian policymakers (Blumen, 2014). More than 20 years have passed since this conference, and there is still the need to prepare children for an uncertain future (Blumen, 2009), as Eric Hoffer stated in 1973: “In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists.”

Nowadays, international and national conferences about creativity and talent development are being uprooted from the school setting towards the organizational setting (Blumen, 2015). Although Peru has significantly advanced in the global community, it still has a deficit pertaining to activities based on knowledge, especially those that significantly support the generation of human capital in learning and innovation (Blumen, 2013).

Empirical Studies in Peru

Studies done with high-achieving youths in Peru have underlined the relevance of context for talent development: (a) children can be called “high achievers” at very different levels of achievement, depending on their school setting: from highly selective private schools to low standard public schools (Alencar, Blumen & Castellanos, 2000); (b) contextual factors should be considered in any definition that aims to explain high achievement, due to the empirical data collected on the impact of nutrition and schooling on intelligence performance (Blumen, 2014; Pollitt, 2007); (c) the relationship between resilience and high achievement is important to be considered in high-achieving disadvantaged youths living in poverty; (d) high achievement would be more appropriately considered as developing expertise (Sternberg, 2000), dependent on environmental stimulation; (e) scientific theory should support the goals in terms of the pedagogical demands and the theoretical construct that support the identification process (Blumen, 2002);

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(f) diagnostic decisions should be made on the basis of valid results from standardized testing; and (g) discussions remain in relation to the nature of the high achievement, and the importance of specialized teacher training.

There are still unsolved issues concerning high achievement in Peru, from the need of a comprehensive paradigm to more practical issues related to identification and intervention; (a) The Spanish term used to refer to the gifted is *superdotado*. However, in Latin American Spanish-speaking countries, this term involves exclusion, leading to the rejection of the gifted. Results on a study about social representations of the high achievers by a group of school teachers by teaching level (Blumen, 2007) showed that misconceptions and stereotypes prevailed, since traits related to pathology, and physical characteristics were still given; (b) the legal framework to provide special services for high achievers must be reviewed, since it bans acceleration as well as early entrance to universities, inhibiting the development of potential for many children, including gifted children (Cross, 2013); (c) topics about education for high achievers should be part of any initial teacher training program that aims to provide a quality education (Subotnik, Olszewski-Kubilius, & Worrell, 2011); and (d) it is necessary to develop advocacy in the media to support high achievers' cognitive and affective needs and to avoid misconceptions that lead to reinforcement of misunderstandings and myths about high achievement (Subotnik & Rickoff, 2010).

Provisions for High Achievers

Talent development is considered a right for high achieving children and youths in Peru. By the end of the 1990s, inclusive policies gained popularity promoting differentiated teaching in regular schools. Teachers were trained in gifted education following the inclusive school model (Blumen, 2002), and creative enrichment programs for the highly able children attending public schools were launched in Primary public schools (Blumen, 2001). Clustering through ability grouping was another common enrichment provision for grades 1–5 in Primary school (Costa, 2001), providing opportunities for the students to be grouped together with academic peers. However, ethnic bias was observed as a significant variable related to the enrichment programs in Latin American countries (Alencar et al., 2000). This finding was replicated in a comparative study between urban and rural talented children coming from multicultural settings in Peru exhibiting similar results (Blumen & Cornejo, 2006).

When Peruvian administration made decisions about the domain-specific area to attend, mathematics prevailed. However, as a nation Peru did not have the rich history of Olympic Math competition that Eastern Europe does or the math culture that East Asia did. Therefore, for mathematically high achieving youths, the use of talent search testing in preparatory Secondary schools provided a motivating arena for competition and for optimization of mathematical talent. They are trained under the philosophy that learning can improve intelligence (Bloom & Sosniak, 1981;

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Gladwell, 2008). They stay at school longer and work harder than their peers, and need counseling support in order to learn to cope with stress. Moreover, Peru does not have a large population by global standards, and most of its population still lives below the poverty line. Therefore, the real talent pool available is considerably smaller.

Taking into consideration that (a) IMO participation is limited to those under 20 years old not enrolled in university, and that (b) Peruvian students begin their university studies when they are only 16 years of age, Peru's team average age is around 14–16 years, often younger than other groups whose age range is 16–19 years. In 2012, the Peruvian team average age was less than 15 years, but the team reached the 16th position, as it did at the 2015 IMO (IMO, 2015). Although Peru has neither the wealth nor the vast educational/training resources available to many other countries, doing well at the IMO might help the medal winners to get an early start in a mathematics career. Moreover, the improvement has been much more gradual than it seems. Peru started competing in the 1980s while passing through a difficult economic crisis, in which money was scarce even for plane tickets. After a gap of six years, Peru was re-inserted in the IMO on 1996, and exhibited a low average performance.

In July 2005, the newly funded PUCP *Interdisciplinary Research Group on Creativity, Technology, and Talent*, housed in the PUCP Psychology Department (Blumen, 2008), developed a coaching strategy based on Post-Traumatic Stress Disorder (PTSD) intervention strategies. Working closely with the staff members of the Mathematics Department, the group developed a series of coaching sessions to support the conative and affective dimensions of the Peruvian IMO team. A pilot study was done in 2006, and the tutors were trained in these strategies to be applied during training sessions. In the IMO 2008, the Peruvian team reached the 17th position (IMO, 2015).

A couple of months later, at the 2008 Conference of the European Council for High Ability (ECHA) in Pamplona, two main factors were discussed: (a) the characteristics of the intensive mathematical training provided, involving former IMO participants as tutors advocating for the team members; and (b) the motivational and affective support program, which anticipated the negative ideas that the high achieving youths might experience going abroad from Peru, in terms of cognitive dissonance, loneliness, anxiety, and self-pressure, among others (Blumen, 2008). After the Peruvian team's positive results at the 2008 IMO, each team member was awarded fellowships to cover both their undergraduate studies following STEM careers at the PUCP and their graduate studies, at *L'École polytechnique*, through French government grants.

Moreover, García's second-term government (2006–2011) generously supported efforts to discover deprived high achieving children. A residential Academy of Arts and Sciences called *I.E. Pública Colegio Mayor Secundario Presidente del Perú*, created by Supreme Decree No 034-2009-ED, on September 09, 2009, was launched on January 2010 to serve the needs of 800 high achieving 9th to 11th

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graders coming from deprived conditions (Blumen, 2011). The Admissions Committee reports directly to the office of the Minister of Education, and guarantees the public transparency of the identification process. The Academic Aptitude test is prepared at the Direction of Secondary Education of the Ministry of Education, and is applied throughout the 26 regions of Peru, in coordination with the Regional Governments, the Education Regional Directions, the National Peruvian Police, and Ministry of Health, among other public institutions, which guarantee security and transparency, as well as student support, throughout the identification process. Final results were published in the website of *Colegio Mayor Secundario Presidente del Perú* (Ministerio de Educación, 2014).

Also, the Regional Government of the Callao Province launched a Secondary day-school for academically talented youths attending public schools in Callao, called *Escuela de Talentos Callao*. *Escuela de Talentos* promotes the maximum development of abilities and attitudes of 10th and 11th graders at the Callao Region (Blumen, 2014). A high-profile qualified and dedicated staff promotes values and ethical principles, and applies ICT in b-learning to form future leaders sensitive to the well-being of their communities, their region, and their country (*Escuela de Talentos*, 2015).

Later, in 2015, Humala's government (2011–2016) launched 12 Residential Schools nationwide for High Achieving Youths (*Colegios de Alto Rendimiento – COARs*) serving 1600 high achievers, following the pedagogical model of *Colegio Mayor*. The COARs decentralize the public educational services for deprived high achieving youths throughout the 26 Peruvian regions. The admission process followed Psycho-Educational Assessment, involving testing on academic achievement, psychological development, social abilities, as well as a personal interview. Every high achieving youth coming from disadvantaged conditions was awarded a fellowship that covers tuition, pedagogical formation, educational materials, a laptop, and a uniform. Moreover, COARs are residential schools that provide housing facilities, meals, laundry services, health services, social assistance, nutrition, and psychological counseling services. The COARs aim to provide a global education that allows students to successfully participate in tertiary education. Facilities include access to libraries, scientific labs, and technological support, cultural activities, and access to grants to continue college studies. Two more COAR schools are expected to be launched on 2016: one for high achieving youths in visual arts, and music; and the other specializing in sports (Blumen, 2014).

Taking into consideration the increasing governmental support given to the high achieving youths coming from deprived conditions, ongoing comparative studies with international support were launched, inserted into the International Research Association for Talent Development and Excellence (IRATDE) (Oh et al., 2015). As the COARs schools serving the high achievers are mainly residential, it is of utmost importance to assess the perception of both teachers and peers towards the gifted boys and girls.

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At the college level, special resources such as universities, research institutions, museums, and other professional organizations, are becoming committed to supporting talent development as well (Blumen, 2014). Furthermore, provisions for talented college students are beginning to be considered in tertiary education (Treffinger et al., 2007). Therefore, mentoring programs are developed for high achieving students attending college (Blumen, 2011). It seems that significant academic relationships between college students and their mentors might constitute a creative and enriching learning space for students, as well as a source of regeneration for professor/mentors from cultural relational theory, and relational practice (Blumen, 2012a). Mentors play an important role in the talent development process with college students, and high achievement is not only the result of their giftedness, but the result of their motivation and the given opportunity.

FULFILLING GAPS IN GIFTED EDUCATION

Peru has made remarkable progress in the field of high ability in past decades. In this sense, Peru was one of the pioneering Latin-American countries in providing a legal framework to serve the needs of the gifted and talented, although its application depends on the nature of the political administration at any given time. Peru has consolidated a significant body of scientific studies related to: (a) screening and identification of the intellectually talented: involving studies that analyze the relations among determinant factors of the academically talented in urban and rural areas, from preschool to adulthood (Blumen, 2008), as they move through school (Blumen, 2001); (b) psycho-educational intervention involving explanatory studies about the impact of the inclusive enrichment programs in creativity and cognition (Alencar & Blumen, 2002); (c) teacher training and formation, with studies that analyze the impact of the training programs in the development of creativity and talent in student teachers (Colangelo et al., 2004), as well as with students along the enrichment programs in school settings (Blumen, 2002); (d) the identification of socio-emotional development, involving personality traits related to the highly mathematically talented who compete internationally; (e) attitudes toward the girl or boy who is academically talented (Blumen, 2007), and social representations about teachers in the different education levels (Blumen, 2012b); and (f) conceptualization of talent development from Amazon and Andean Cosmo vision (Blumen, 2008).

In 2010, Peru also became the first Latin American country to launch a Residential Academy of Arts and Sciences, to serve the needs of 800 high achieving youths coming from impoverished contexts nationwide (Blumen, 2014). Moreover, intensive networking along international events, as well as the possibility of having an International Templeton Fellow in the country, led to the organization of four biennial International Seminars on Creativity, Technology, and Talent, as well as the 2008 FICOMUNDYT Ibero-American Conference on Gifted Education together with the International Ibero-American Summit of Talented Youths. It also gave more

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public exposure to the topic of high achievement and talent development, generating advocacy towards their needs. Furthermore, media exposure in relation to advocacy towards talent development significantly improved in terms of frequency for TV programs and Radio interviews, as well as in the newspapers.

Also, in order to provide spaces to facilitate the emergence of talents along the different educational levels, and taking into consideration the need to generate human capital of excellence in learning and innovation in order to become globally competitive, (Blumen, 2008) the project Creativity, Innovation and Talent (CIT) (Blumen, 2007, 2008) was proposed. This project reorients intervention spaces from school classrooms in Elementary and Secondary education, towards college education. The CIT Project aims to promote quality and excellence from the development of educational competitiveness, through the identification and support of talented school and university students, promoting their creative abilities, and innovation applied to science and technology, as well as their educational, humanistic, and social development.

It is possible that the most sustainable provisions and efforts come from research centers at university settings. In this sense, the free-entrance Annual International Seminar on Creativity, Technology, and Talent, held at the Catholic University by the research group of the same name is an example of a dynamic academic and professional meeting in which educators and psychologists nationwide assist by invitation, and have a space to analyze different provisions for high achieving deprived youths in an academic context.

Having developed literature based on empirical studies, the main constraint is to rank policy prescriptions in terms of potential cost-effectiveness based on research. It is known that there are Peruvian public schools that produce good results even though their clientele is poor (Chauvin, 2000). However, there are few credible models of systemic interventions that truly work in driving cognitive development among those living under conditions of poverty (World Bank, 2011). The most significant difficulty that remains is related to clear policy agreements on the variables affecting learning, as well as implementing solutions coming to agreement on standards, management, and the spending needed (WEF, 2010).

There also is need for a theoretical framework to identify the gifted and talented in a context shaped by multiculturalism and poverty, taking into consideration that: (a) the native population and girls are underrepresented in domain-specific academic talents; (b) nutrition and schooling are significant variables in any screening or identification process; (c) resilience associated factors must be considered in social excluded and marginalized communities; (d) the central system style of curriculum exhibits low levels of flexibility; and (e) the definition of giftedness and talent needs to include culturally-friendly variables.

Thinking about the future of gifted and talent development in Peru, it is of utmost importance to improve our comprehension of talent development within ethno-linguistic diverse and poverty contexts. Formal lineaments of talent promotion are needed, with the commitment of civil society, and policymakers, involving

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the participation of the enterprises and colleges/universities, supporting talent development with social responsibility. This raises the potential for professionalization in a global perspective with the benefit of cross-fertilization of ideas, as should be the mission of any organization for cooperation in gifted education.

MAJOR TRENDS FOR THE FUTURE

Although the outcome of the many forces and drivers of the future is highly uncertain at this time, one thing is certain: The majority of those who will inhabit the world by the end of the 21st century need to be prepared for living in a complex, changing world, overloaded with stimuli that might need to be screened for selection specific to various purposes. The future can be imagined based on the prevailing trends, and on data available to us. At present, the world is experiencing intensified strain on resources due to the fast pace of growth of emerging economies (Klare, 2012). These patterns of economic growth, and social and economic development, dynamics of political interests and interactions within societies as well as between states, the emergence and spread of new technologies, and diffusion of power, will shape the world in the next 20 years. North America, the European Union, South Eastern Asian nations, and Australia are the leading game players.

In order to prevent the potential impact of a global collapse, as discussed in the focus chapter of this volume (Ambrose, chapter 2, this volume), and to help emerging economies become the developers of future problem solvers, it is of utmost importance to focus on the need of a comprehensive global change in health and educational services, particularly in transitional and emerging economies. These changes will require the following: (a) curriculum methods should move away from rote learning toward emphases on creative thinking about academic content; (b) effective collaboration and communication skills should be promoted; and (c) global homogenization *per se* should be replaced by models that fit various cultures. This cannot be understood as the sole responsibility of the emergent democracies, but as a global responsibility shared by those who can provide expert support.

The experience with high-achieving youths living in deprived conditions in Peru shows that the success of the identification processes and talent development strategies depend mainly on the following conditions:

1. The awareness and commitment at governmental decision-making levels on the importance of serving the cognitive, conative, and affective needs of high-achieving youth, from a comprehensive psycho-education model, to form citizens committed to supporting the local, regional, and national aspects of democratic society towards a culture of peace, for personal and collective well-being.
2. The meaningful integration of the identification and provision functions in the government administration at a national, sectorial, and program level.
3. The development of human and financial resources in order to support professional groups of evaluators and specialists in gifted education.

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4. High achieving youths learn that academic achievement and meritocracy go together with solidarity and collaborative processes, towards the establishment of common well-being.
5. Mentoring programs for high-achieving youths living under deprived conditions should be created, in order to provide them with highly individualized learning conditions, learning competencies, and self-regulated learning skills.

International cooperation might support Peruvian identification and provision practices by:

1. Establishing an international framework for the legitimacy of talent development, as part of civic responsibility.
2. Increasing the use of identification strategies, supporting screening and identification processes for the gifted in national policy decision making.
3. Building capacity through training opportunities on gifted education among health and education professionals.
4. Developing general procedures, ethics, and a code of conduct for assessment of high achievers, and provisions for talent development.
5. Providing forums for the exchange of good practice in the identification of the highly able and provision of knowledge through cooperative research.
6. Supporting cultural specificity in identification of high achievers and developing provisions for them, through pilot studies in diverse cultural settings.

Although mapping the future is difficult, in order to face the challenges of a changing and complex world, high-achieving deprived youths need to develop their areas of expertise with respect to the conditions they face within and beyond their local contexts. Moreover, they need to learn assertive and creative strategies to solve problems, to develop positive attitudes, and to develop the abilities necessary for successful negotiation. High achieving youth coming from conditions of poverty can contribute to the construction of successful societies based on knowledge, respect, tolerance, and appreciation for the value of cultural diversity in different regions of the world.

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10. CLEARING THE WAY FOR PIVOTAL 21ST-CENTURY INNOVATION

More Talent Literacy, Less Talent Management

A convergence of unprecedented 21st-century shifts are rocking the world, confronting the global community with extraordinary challenges for which traditional problem-solving strategies will be unavailing. In response, the world will turn to innovators and gifted problem-solvers as never before. Luckily, radical disruption is tailor-made for these individuals. They experience insurmountable challenge in unique ways—flourishing in adversity, inspired by complexity, energized by labyrinthine problems, and always on the lookout for hidden opportunities. Organizational leaders will be compelled to quickly adapt and rethink how they work with innovators. To clear the way for pivotal innovation, two key steps will be required: (1) change organizational attitudes and processes, and (2) counteract stereotypes that demoralize innovators and undermine creative effort. Correspondingly, talent management will need to be reinvented from the ground up. Talent programs fail because they are missing the requisite foundation—an understanding of *talented people*. I introduce *talent literacy* as a fundamental course correction. Talent literacy re-humanizes and re-defines talent as exceptional abilities that are inseparable from the people who possess them, not inert commodities to be managed.

Throughout the ages, tumultuous upheavals have jolted the world, driving societies to adapt in unexpected and often unwanted ways. Today, mounting pressures brought on by globalization, technological advances, and environmental crises are radically altering the world as we know it:

The continued march of globalization, the growing number of independent actors, and advancing technology have increased global connectivity, interdependence and complexity, creating greater uncertainties, systemic risk and a less predictable future. (VISION, 2015, p. 10)

Paradigm shifts generate unyielding pressure and choices must be made. The ever-increasing speed of change calls for rapid-response adaptations that are challenging and unnerving. Globalization is a contentious issue and people often take sides—for it or against it. Nonetheless, globalization advances at its own pace regardless of opinion.

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UNPRECEDENTED PROBLEMS AND OPPORTUNITIES

There is little doubt that globalization is an instigator of unparalleled macroproblems that may well outpace our ability to deal with them. At the same time, the world is being presented with countless prospects for advancement—macro-opportunities. A report from the World Economic Forum (2015) illustrates the entwined nature of the two:

Information flows instantly around the globe and emerging technologies have boosted the influence of new players and new types of warfare ... [and] past warnings of potential environmental catastrophes have begun to be borne out ... Disciplines such as synthetic biology and artificial intelligence are creating new fundamental capabilities, which offer tremendous potential for solving the world's most pressing problems. (p. 11)

Globalization also encourages fast-growing international competition that is likely to benefit high-power societies while leaving low-power societies behind. For example, less developed nations may not be able to navigate increasingly complex international laws and will therefore miss out on opportunities or become targets of exploitation (Brooks, Weatherston, & Wilkinson, 2011).

The World Health Organization (WHO) spotlights a healthcare human resource crisis as one of the most concerning global issues of the 21st century. They predict a shortage of more than four million healthcare workers (e.g., doctors, nurses, midwives). This trend is linked to growing opportunities for work beyond the local community and the appeal of moving from low-income to high-income countries: "This global migration pattern has sparked a broad international debate about the consequences for health systems worldwide, including questions about sustainability, justice, and global social accountabilities" (Aluttis, Bishaw, & Frank, 2014, p. 1).

Erosion of democracy presents another macroproblem. Some scholars argue that financial globalization gives rise to a "golden straightjacket" for governments that "narrows the political and economic policy choices of those in power to relatively tight parameters" (Friedman, 2012, p. 106). Indeed, the argument has been made that the authority of many state governments is being usurped by financial markets resulting in a state-market reversal of power (Cerny, 1999; Helleiner, 1994; Strange, 1996).

Fortunately, globalization also gives rise to macro-opportunities for leaps of progress. Each advance is expected to quickly trigger the next, setting off a high-speed innovation domino effect. For example, forecasters involved with manufacturing anticipate a new era in which today's concept of production will be markedly altered. The world's automobiles are currently being manufactured by a relatively small number of factories, though perhaps not for long. In the near future cars may be produced in many metropolitan areas:

Parts could be made at dealerships and repair shops, and assembly plants could eliminate the need for supply chain management by making components as

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needed ... Creativity in meeting individuals' needs will come to the fore, just as quality control did in the age of rolling out sameness. (D'Aveni, 2013)

Some predictions may seem too farfetched to ever be possible. And yet that was probably the majority opinion in the 1980s when innovators began to talk seriously about 3D printing (additive manufacturing). 3D printing is already here and revolutionizing our understanding of materials production, perhaps even setting off a new industrial revolution (Kilel, 2014). 3D printing will allow us to produce—on demand—a mind-boggling array of products from clothing to solar-electric cars. According to development engineer Yasim Ali (2015), we are “moving away from the mass production culture, where you see what someone else has and you want it, onto a phase of individualism where you want your product to be unique, useful and defining of your personality” (para. 4).

Yet while 3D printing is getting underway, advances are being made that could surpass it. Australian researchers are making significant progress with 4D printing, where time is the fourth dimension. They begin with 3D-printed materials and go one step further with an additional process whereby the materials morph into new structures when exposed to certain stimuli, such as heat or water: “3D printing is so last year—we’re onto 4D printing now. The cool thing about it is it’s a working functioning device that you just pick up from the printer ... no assembly required” (in het Panhuis, 2015).

With creativity and innovation expected to drive the global economy, some argue that we are embarking on a new era. According to business writer Daniel Pink (2006), the Information Age that has belonged to the knowledge worker—the “logical manipulator of information and deployer of expertise”—is rapidly declining, giving way to the Conceptual Age that is built on “inventive, empathic and big-picture capabilities.” (pp. 1, 3). Van der Pol (2007) submits that if the quality of our future hinges on existing global resources, perhaps creativity is the most advantageous resource of all. The growing emphasis on ideas vs. physical assets is evidenced by a fundamental shift in market valuation: “the transition of leading Western economies away from the processing of materials, basic manufacturing, to high value intangible, or “weightless” activities” (Coyle, 2011, p. 150).

If indeed innovation and ingenious problem-solving are to be the architects of the future, it follows that creative intelligence may largely determine whether or not we successfully manage radical changes that are fast approaching: “From economic disruption, political upheaval, and other crises of the moment, to the perennial issues of disease, thirst, and famine, rarely has the world seemed so beset—or the need for new thinking more stark” (Mycoski, 2012, p. 2).

HISTORICAL ADAPTATIONS TO MAJOR DISRUPTION

History reminds us that when the world has been forced to contend with major disruptions, some human responses have been adaptive while others have

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not—well-judged decisions are advantageous while injudicious choices create problems that are sometimes disastrous. Archival records suggest that choosing an action (or inaction) at these times is a complex matter, and outcomes are rarely the result of a single influence. Yet even a cursory examination of major global events reveals a key determining factor—flexibility—that often tips the scales. Flexibility is a prerequisite of openness to change, which in turn provides more options for effective adaptation.

To a great extent, human beings exist today because of innovative responses to extreme conditions—flexible creative thinking that enabled effective adaption and thus survival. For instance, during the “Little Ice Age” in Greenland in the 1300s, Inuit and Norse (Vikings) were confronted by the same climate shift that changed their relatively warm environment to one that was progressively colder. The two societies responded in sharply different ways that ultimately determined Inuit survival and the demise of their Norse contemporaries. Archaeological evidence indicates the Inuit were quite willing to adopt ideas and technology from the Norse. Metal goods manufactured in Europe and imported by the Norse found their way along Inuit trade routes through the Arctic. The Norse, however, were unwilling to take advantage of Inuit expertise, making no effort to simulate kayaks and harpoons that would have enabled more effective utilization of food resources (see Shoalts, 2011).

In times of major crisis, under-reaction or the denial of a need for action, has tended to accelerate destabilization. Tainter (1988) refers to scholarly arguments that point to inflexibility and failure to adapt as central factors in the collapse of societies:

complex societies disappear because of some inability to bring forth an appropriate response to circumstances. Melko (1969), for one, argues that once established a civilization’s capacities for change become limited. Collapse results from sociopolitical ossification, bureaucratic inefficiency, or inability to deal with internal or external problems. Ho attributes the decline of Ming China to such matters (1970) ... Gregory Bateson (1972) suggested that civilizations expire by loss of flexibility, and that flexibility is lost automatically if it is not exercised. (pp. 56–57)

When considering human progress, we can identify the Stone Age (200,000 years ago), the Bronze Age (7,000 years ago) and the Industrial Revolution (250 years ago) as three defining periods when advances in technology sent humanity in a new direction. These fundamental changes were experienced by past societies over long periods of time. The world now faces different, though equally disruptive, radical change, the difference being the exponential rate of advancement in life-changing technologies (Rosselló, 2014).

Practically speaking, globalization has laid the foundation for a very different future when what is new today is likely to be obsolete tomorrow—a situation of all new, all the time. Moreover, many of today’s problem-solving strategies may soon

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become obsolete—tried-and-true methods of little value in the face of incomparable problems. How then are societies to deal with macroproblems when they lack the skills required to solve them? It is fortunate that when confronted by great adversity, it is the nature of humanity to rise to the occasion.

THE NATURE OF INNOVATORS

If the world is to depend on creative problem solving to forge a future of progress rather than demise, I argue that innovators—those who possess exceptional creative intelligence—are collectively equipped to produce micro- and/or macro-solutions. Common sense informs us that in the face of rapid change, effective problem solving is difficult at best. This is compounded by the fact that we will be confronted by anomalous challenges that necessitate improvisation. But innovation cannot simply be had for the wanting. And because innovation is inextricably human, it is essential to understand the true nature of those who possess exceptional creative intelligence—individuals who are the source of innovation.

Scholars who investigate high ability and creative intelligence are well aware of the accompanying characteristics. They understand that prevailing stereotypes are baseless, concocted and perpetuated for all the wrong reasons. For those who are not scholars of creative intelligence, scientifically verifiable traits of highly talented people are largely unknown. Why does an understanding of the nature of creative intelligence matter? For innovation to happen, innovators must be free to imagine and create, and to feel valued and appreciated for *who they are*, not just *what they produce*. Every innovation begins as the brainchild of one or a few creative thinkers who then take on the monumental task of bringing the idea to life, making it real and practical. Like everyone, their abilities are associated with primary traits, characteristics that develop from the inside out, not learned at school or chosen by the individual. Although high-ability individuals are predominantly the same as everyone else, from an early age they display particular qualities that make them stand out. Moreover, the world values creative problem solvers *because of* their unusual differences.

Perhaps one of the most easily understood summaries of high-ability characteristics was presented by Frasier and Passow (1994), ten core characteristics of creatively gifted individuals, though not all may be present in a particular individual: motivation; intense and unusual interests; highly expressive communication; effective problem solving; curiosity (inquiry); quick insight and grasp of new information; exceptional memory; skilled application of logic and reasoning; creativity and vivid imagination; quick grasp and communication of humor.

In part, exceptional creative intelligence stems from extraordinary cognitive efficiency (Anokhin, Lutzenberger, & Birbaumer, 1999; Jaušovec & Jaušovec, 2003; Jin, Kim, Park, & Lee, 2007; Neubauer, Grabner, Freudenthaler, Beckmann, & Guthke, 2004). Although a detailed discussion of neurobiological variations associated with high ability is beyond the scope of this chapter, studies from

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neuroscience (see Dehaene, Kerszberg, & Changeux, 1998; Geake & Hansen, 2005; Hofstadter, 1995, 2001) provide compelling information. According to Geake (2008), “fluid analogizing explains their more efficacious working memory, which in turn supports high levels of creative intelligence” (p. 187). Geake further explains: “creative thinking requires fluid analogizing, where fluid analogies are those without a strict or limited ‘correct’ answer” (2011, p. 45).

A creativity-driven global market straddles economic, political, social, cultural, ethical, and environmental issues, promoting new interactions at the crossroads of art, business, and technology. Propitiously, individuals with high creative intelligence are capable of successfully connecting and integrating a wide range of perspectives, ideas, and knowledge, and then effectively operationalizing the results in incredibly novel ways (Root-Bernstein, Bernstein, & Garnier, 1995; Jacobsen & Ward, 2010a; McCrae & Costa, 1989; Parker, 1996). This ability is associated with *cognitive diversity* (differing perspectives, ways of seeing the world, and approaches to problems), a 21st-century macro-opportunity whereby individuals from various and complementary fields and areas of expertise coordinate their ideas and efforts to solve problems (Franceschet & Costanini, 2010). Mitchell and Nicholas (2006) argues that cognitive diversity is a critical element in problem solving: “the integration of diverse perspectives and previously unconnected knowledge underpins the generation of new knowledge” (p. 67). Indeed, a well-functioning diverse team will typically outperform homogeneous groups (Edmondson & Roloff, 2000; Erbe, 2014; Janssens & Brett, 2006; Page, 2008; Suresh, 2013).

Perhaps the least understood (and most often misrepresented) traits of high-ability individuals are those related to social behavior. Television and movies have planted such indelible pictures in our minds that whenever high-ability individuals are mentioned up pop the familiar characters such as the inept oddball, oblivious to everyone else and a bungler of social interaction. Research evidence points in the opposite direction, informing us that these individuals tend to be extra aware of others feelings and concerns, and quite empathic (Berkowitz & Hoppe, 2009; DiBiase, Gibbs, & Potter, 2005; Heller Perleth, & Lim., 2005; Jacobsen, 2000a; Lovecky, 1992). Similarly, people with exceptional abilities often pursue and develop positive relationships (Van Lieshout, Scholte, van Aken, Haselager, & Riksen-Walraven, 2000), and prefer give-and-take teamwork (with true peers) over individual effort (Jacobsen, 2000b; Jacobsen & Ward, 2007; O’Shea, Heilbrunner, & Reis, 2010). They are characteristically open-minded and flexible (see Renzulli, 2002). However, one should not assume this makes them overly agreeable or gullible. Highly intelligent people tend to be selectively autonomous, which is observable during childhood (Betts & Neihart, 2004; Torrance, 1965). With selective autonomy, they are able to maintain both their affinity for wide-ranging perspectives and their confidence as independent thinkers who are willing to promote their own views and ideas (Benson & Campbell, 2007).

Self-motivation, self-discipline and conscientiousness are standard features of highly talented individuals as well (Dudeck & Hall, 1991; O’Shea, Heilbrunner, &

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Reis, 2010; Tomlinson-Keasey & Little, 1990; Ward & Jacobsen, 2010a). This is evident in the remarkable amount of time and energy they devote to systematically solving problems and striving for excellence in areas of interest to them (Fornia & Frame, 2001; Jacobsen, 2000a; Jensen, 2008; Siekańska & Sękowski, 2006). Furthermore, and especially relevant for resolving macroproblems, high-ability individuals are genuinely comfortable in situations of heightened ambiguity, complexity, and uncertainty; they move toward, not away from, multifaceted problems and “can’t-be-done” challenges. They have a high need for complex cognition (Fischer, 2005; Fleischhauer, Enge, Brocke, Ullrich, & Strobel., 2009; Meier, Vogl, & Preckel, 2014; Proctor, Black, & Feldhusen, 1988) and are uncommonly enticed by demanding conditions and fuzzy problems.

ICD: AN ORGANIZING FRAMEWORK

As may be readily apparent, the extensive list of high-ability traits can be overwhelming. To address this problem, an organizing framework (Jacobsen, 2000a) is provided that encapsulates the characteristics of high-ability people in three overarching categories: Intensity, Complexity, and Drive (ICD).

Intensity involves attributes that represent quantitative differences (i.e., ways in which the individual has “more” of something). It includes insatiable curiosity, fast and fervent learning, exceptional energy, unusual sensitivity, and deeply-felt emotions (see also Dabrowski, 1972; Dabrowski & Piechowski, 1977). In many ways, Intensity is linked to a powerful need to know—wondering, searching, discovering, solving, and understanding. High-ability people “tend to possess a lot of knowledge, but its accumulation is a by-product of their ability to understand better and learn faster” (Gottfredson, 2002, p. 29).

The *Complexity* category represents differences that are primarily qualitative in nature (e.g., thinking on multiple levels at the same time, anticipating trends long before they are recognized by others, bridging seemingly antithetical concepts). This umbrella trait takes the aforementioned comfort with ambiguity and complexity a step further as a penchant for defying improbability. Complexity also includes fluid analogizing as previously discussed (see Geake above). It also underlies multifaceted original thinking, heightened perceptivity, and an unusual capacity for innovation (i.e., to “make something out of nothing”).

Drive encompasses characteristics such as intrinsic motivation, perseverance, and dedication to a purpose or mission. It is often manifested as exceptional commitment to a goal and willingness to see it through against all odds. Drive enhances idea generation; these individuals are not only creative, they are creative producers. Essentially, Drive operates in the service of Intensity and Complexity, though not entirely. Drive has its own general effect on high-ability individuals who regularly describe feeling “driven” from the inside. They feel compelled to “do something that really matters”, to work with passion, purpose and a strong sense of meaning. This can be observed in the way they strive for excellence, whether building a doghouse,

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delivering a persuasive speech, or formulating a new medicine. They have a strong sense of what they want to (or must) accomplish, and thus are prone to stay focused on a challenging project long after everyone else has called it a day.

The ICD categories are summarized in Table 1:

Table 1. ICD Model of high-ability characteristics (Jacobsen, 2000a)

INTENSITY (quantitative differences)	High energy, renewable enthusiasm, passion Insatiable curiosity (“need to know”); challenges status quo Heightened sensitivity and empathy; deeply felt emotion Extraordinary memory Fast learning and development of knowledge
COMPLEXITY (qualitative differences)	Exceptional perceptivity, insightfulness, “intuition” Multi-track simultaneous thinking & fluid analogous thinking Ability to bridge seemingly antithetical concepts Distinctive capacity for idea generation and innovation Comfort with ambiguity, rapid change, and unknowns
DRIVE (motivational differences)	Strong intrinsic motivation; self-directed Distinctive enduring need for challenge; boredom = stress Remarkable creative productivity; repertoire of proficiencies Steadfast commitment and inner pressure to persevere Need for purpose and meaningful work

MISCONCEPTIONS AND ATTITUDES THAT UNDERMINE INNOVATION

Once the genuine characteristics of high ability are known, it is easier to spot misconceptions and faulty beliefs. This is important because stereotypes demoralize innovators, chip away at trust, and hinder creative effort. In addition, it is my contention that contemporary business-speak undermines innovation for a specific reason—it has basically dehumanized talent. Again, little has changed in this regard since the 1950s. Today’s organizations tend to conceptualize, categorize, and manage talent as if it were a commodity—some-thing to be harnessed and propelled forward through a pipeline, an asset to be acquired and then cultivated, moulded to purpose, and carefully managed to reap the benefits—hence, “human capital.”

Prevailing misconceptions of high-ability people can also be found in books, articles, blogs, and interviews with authoritative voices in the business world. For example, in Goffee and Jones’ (2009) book, *Clever*, the preface defines it as a guide for effectively “leading your smartest, most creative people.” Regrettably, they contradict their stated purpose by endorsing a series of spurious descriptions of high-ability people as:

recalcitrant (p. xvi), needy (p. 9), incessant interrogators of those who hope to lead them (p. 28) [and urge managers to grant] ... clever people resources and

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space because it is the only way to prevent them from using their Machiavellian talents to extract what they need. (p. 49)

Jaundiced views and prejudicial mind sets about exceptionally talented people are diametrically opposed to the goals of most organizations and a major barrier to innovation.

INNOVATION IN A NEW WORLD OF WORK

By all appearances, society can ill afford to stand in the way of possibility and progress. With so much changing so rapidly and the complex challenges that lie ahead, organizational leaders can choose to promote innovation by re-thinking their attitudes toward, and relationships with, high ability. To remain relevant, astute organizations will implement radical modernizations that take them out of their comfort zone because they understand that progress involves disruption and global shifts always upend the status quo (Bryan & Joyce, 2007).

Leading organizations are motivated to change because they can see the big picture. As the 21st century plays out, organizations and economies that foster creativity are expected to generate higher revenue and greater stability than their die-hard traditionalist competitors. According to Guttman (2009), organizations are “like living organisms; their survival and success depend on similar evolutionary forces. Failure to adjust to changing conditions renders both the organizations and the organisms unfit to survive (p. 268)”.

In the 20th century, organizations were usually hierarchical entities where decision-making and authority came from a restricted center of operations at the top. Many were built around a collection of silos separated by inflexible walls, each operating as its own fiefdom. These models were later considered out of step, and “fell under attack by the four horsemen of the revolution around us: globalization, the growth of information technology, new forms and intensity of competition, and pressure for rapid innovation” (Guttman, 2009, p. 269).

Last-century views of work are fading into the annals of history. As early as 2007, UNESCO issued a report (van der Pol) describing key changes on the horizon:

The traditional office, where people sit statically at dedicated desks working a 9–5 routine, is rapidly being transformed into a highly mobile workplace of the future ... Organizations anticipate that, as a result of mobile work styles, a third of their people will no longer access corporate applications, data and services from the local workplace or office. Workplaces—with fewer dedicated desks, forecast to be almost a fifth smaller—will be redesigned to provide inspiration and encourage collaboration. (Citrix, 2012, p. 16)

At the same time, employee expectations are changing, prompting demands for greater organizational flexibility. This stands to reason as people’s lives are becoming more complex, often filled with multiple obligations (e.g., spouse, children, elderly parents), requiring them to juggle a number of conflicting demands.

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In today's more horizontal organizations, the term "leader" is being redefined as well, especially with regard to innovation. More and more, leadership is about high-performance teams (typically ten or fewer individuals). Responsibility for major strategic decisions continues to rest on the shoulders of a few at the top. Other than that, organizational success largely depends on the quality of its high-performance teams—outstanding teams lead to outstanding organizations; mediocre teams to mediocre organizations (Guttman, 2011). Mark Camastral summed it up in 2005 when he was regional president for Mars, Inc. in Latin America, later to become Mars' global president: "A high-performance team is not a leaderless team, but a team of leaders."

Alignment with several key aspects of the organization is essential for high-performance teams, including trust, a hybrid macroproblem/macro-opportunity. Coyle (2012) highlights a progressive erosion of trust in Western societies: "Trust is both more essential and fragile in the modern economy" (p. 7). Discerning leaders will honestly evaluate organizational trust and adopt measures to bolster it. Similarly, employees increasingly expect their organization to be authentic, a place where they can trust management to live up to their asserted goals. And, conventional motivation practices are on the endangered species list. For many years, the need to *motivate* employees has been a foregone conclusion. That is about to make a dramatic shift. Rao's (2009) argues, "The organization of the future will not even attempt to 'motivate' workers. Instead, it will go to great lengths to find out what is demotivating them and try to get rid of whatever that is" (p. 41).

At almost every level, organizations will have to choose how they respond to the forces of change. Some may decide to do nothing clinging to the hope that the status quo will prevail. Others may recognize the need for a swift response but lack the knowledge to move in the right direction. However, judicious organizations will not wait to see what happens. They will be aware of predictions and trends and alter their structure and procedures as needed to stay ahead of the curve.

RESTRUCTURING TALENT MANAGEMENT

For organizational talent managers, the pressure is on to break away from established talent practices, especially in light of the spate of failing talent strategies. The recent economic downturn did not cause talent programs to fail, but it did spotlight their ineffectiveness. A PriceWaterhouseCoopers (2010) global CEO survey exposed a number of disconcerting problems. Seventy-six percent of CEOs reported loss of confidence in their talent strategies, intending to significantly change their organization's talent approach, and more than two thirds believed their performance management systems were not even capable of identifying high potential.

A summary report of a global study conducted by Towers Watson (2010) asserted: "Even those talent management programs that are considered most effective—specifically, employee learning and development, and performance

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management—are rated as very effective by less than 30% of organizations” (p. 16). A ten-year follow up to the landmark 1998 McKinsey report on the “war for talent” (Chambers, Foulon, Handfield-Jones, Hankin, & Michaels) was even more disturbing. The investigators (Guthridge, Komm, & Lawson, 2008) concluded:

Companies like to promote the idea that employees are their biggest source of competitive advantage. The astonishing reality is that most of them are as unprepared for the challenge of finding, motivating, and retaining capable workers as they were a decade ago. (p. 49)

It would seem that the handwriting has been on the wall for many years; talent management has been working against itself. An examination of talent management history reveals early warning signs of program failure. Almost unbelievably, the vast majority of existing talent management strategies were developed *six decades* ago during the Sputnik era. Peter Cappelli’s (2008) observations underscore talent management’s prolonged inertia:

Talent management practices, especially in the United States, fall into two equally dysfunctional camps. The first and most common is to do nothing—making no attempt to anticipate your needs and developing no plans for addressing them. This reactive approach, which effectively relies on outside hiring, has begun to fail now that the surplus of management talent has eroded. The second strategy, which is common among older companies, relies on complex bureaucratic models of forecasting and succession planning from the 1950s—legacy systems that grew up in an era when business was highly predictable. These models fail now because they are inaccurate as well as costly. (p. 2)

To put this into context, scores of today’s talent programs were developed for an organizational climate that no longer exists—Dwight Eisenhower was President of the US, the average cost of a car was \$2,000, and the newly developed personal computer was the size of a bookcase with only 4Kb of memory and a \$55,000 price tag!

A breakdown of talent programs often arises from what I call “talent illiteracy”, a functional impairment due to a comprehensive lack of knowledge about talented people. Despite widespread agreement about the inestimable value of high-ability employees, scores of organizations do not have even a rudimentary understanding of the very people for whom their talent programs exist.

ESTABLISHING TALENT LITERACY

To bring this all together, I propose *talent literacy* as an essential course correction. For organizations that rely on innovation, talent literacy is crucial. Unlike standard talent approaches, talent literacy is founded on an evidence-based understanding of

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the traits, motivations, and needs of exceptionally talented people. It is more than awareness and information; it is a skill set to be built and applied at all organizational levels.

The first, and perhaps most critical step toward talent literacy, is the active deconstruction of stereotypes. This is not simply a set of feel-good exercises; it is a major change of attitude and a key strategy for organizational success. Efforts to adjust mind sets and misconceptions about high-ability employees can be done in a number of ways (e.g., workshops, webinars, development programs, employee-driven learning processes, executive coaching, facilitated discussions, tailored team-building). But success hinges on (a) knowledgeable, talent literate facilitators and (b) a top-down organizational commitment to talent literacy.

Once talent literacy procedures have been put into action, everyone who makes decisions about organizational strategy or is involved with innovators (e.g., C-level executives, recruiters, R & D managers, job interviewers, leaders of high-performance teams and innovation processes, managers of leadership development programs) should have access to an external support resource. An objective talent literacy advisor can monitor progress and help with problems when they arise.

As talent literacy takes hold it enhances the organization's culture and brand, and goes a long way toward building trust and a reputation for authenticity. It also provides a distinct advantage for identifying exceptional talent, a task that has been prone to serious decision errors. Once the genuine characteristics of creatively intelligent individuals are known and stereotypes are rejected, it is much easier to separate a true high potential from one that is good, but only promotable. A talent literate organization is more likely to make correct decisions about all aspects of talent development and innovation, and, importantly, to know why they are correct. Furthermore, as organizations build talent literacy they foster a sense of "we're in this together" among employees and management. Talent literacy will also improve leader effectiveness. They will possess the skills to discern what key employees need to thrive at work, and provide support accordingly. Talent literacy is far more than exercises in relationship building, it is tied directly to the bottom line as it helps prevent costly bad-hires and the fallout that accompanies the untimely departure of an exceptionally talented employee.

WORK-SPECIFIC APPLICATIONS OF TALENT LITERACY

Regardless of career or field, stimulating, competency-stretching work is a must for high-ability employees. For them, ongoing challenge is not just a preference; it is an enduring need (Freeman, 1993; Gallagher, Harradine, & Coleman 1997; Jacobsen, 2000a, 2000b, 2008; Kanevsky & Keighley, 2003). This underlying need explains why they are energized by convoluted problems when others would find them nerve-wracking (Jacobsen, 1999c). When work becomes predictable and under-challenging, boredom sets in, a major stressor for creatively intelligent

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people. When dullness reaches the tipping point it's usually not long until high-value employees pack up their brilliant ideas, insights, and creativity, and move on. In an exploratory global online survey of high-ability adults I have been conducting since 2012, participants are asked about their reasons for leaving an organization. Thus far, 67% have endorsed "feeling bored and under-challenged" as their number one provocation for resigning (Jacobsen, 2015).

Highly creative individuals also want their efforts to be meaningful, to make a positive difference (Ferriman, Lubinski, & Benbow, 2009; Jacobsen & Ward, 2007; Ward & Jacobsen, 2010b). Not surprisingly, a large portion of their job satisfaction depends on the degree of freedom they are given to apply their exceptional abilities and unique skills (Sears, 1977; Siekańska & Sękowski, 2006). They often excel when their work is associated with what really interests them. Work is more gratifying for them when their jobs provide opportunities to translate their inventiveness into action rather than serve only as a source of ideas (Siekańska & Sękowski, 2006).

When building a culture of talent literacy, attention also must be paid to inclusion and involvement. More often than not, creatively intelligent employees do not do well when they feel sidelined. Though eager to deliver on their exceptional abilities at work, they also want to be included in important organizational decisions (Ferriman, Lubinski, & Benbow, 2009). This being the case, talent-literate organizational leaders are inclined to listen and collaborate with these perceptive employees, and to establish a risk-free way for them to speak truth to power (Ward & Jacobsen, 2010b).

CONCLUSION

There is no escaping the effects of globalization and high-speed change. The world is, and will continue to be, confronted by macroproblems, though also presented with macro-opportunities. Perhaps more than ever, the global community will turn to innovators for effective solutions to complex problems and ingenious ways to promote the betterment of the world. Fresh approaches and novel solutions require creative intelligence and cognitively diverse collaboration, the underpinnings of innovation.

Leaders of organizations are in a unique position to help clear the way for pivotal 21st-century innovation. They are urged to put aside ineffective talent management practices, and to establish talent literacy as an evidence-based framework for new talent approaches. If the goal is to foster idea generation and inventive problem solving, organizations must refocus on the human side of innovation—the individuals whose exceptional abilities are the wellspring of breakthrough ideas and world-enhancing solutions. An organizational culture built on talent literacy draws in creative employees and offers them a powerful incentive to stay. It might be wise for organizational leaders to bear in mind that whenever high-value employees leave an organization they take with them all of their knowledge, experience, ideas, and

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untapped potential, and many times head straight to the competitors (DeVries & Kaiser, 2003). And above all, those involved with talent and innovation at every level should remain cognizant of a particular fact—creative talent is inseparable from the individuals who possess it.

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DOROTHY A. SISK

11. FILLING THAT EMPTY SPACE IN THE LIVES OF PEOPLE IN A GLOBALIZED WORLD BESET WITH TURBULENCE AND CRISES

In a world beset with turbulence and crises, coupled with the materialism and individualism of Western culture, an empty space has been created in the lives of many people, and there is a growing need for spirituality, a search for community as a result of urbanization, and a search for identity in an increasingly depersonalizing global society. No one needs to fill that empty space more than gifted and talented students. In this chapter, the concept of Spiritual Intelligence is explored, and defined as the capacity to use a multisensory approach including: intuition, meditation and visualization to tap inner knowledge to solve problems of a global nature. The key virtues, the core capacities, core values, core experiences, the symbolic system, and brain states of Spiritual Intelligence are discussed. Living stories of selected pathfinding individuals and youth demonstrating Spiritual Intelligence in their lives are examined as examples of spirituality in action. This chapter concludes with suggestions and activities to nurture and develop Spiritual Intelligence as a viable form of giftedness, and the likely traits of Spiritual Intelligence are listed with ways to strengthen the traits for learning.

More and more people everywhere are becoming ready and concerned with the untapped potential of the mind and higher levels of consciousness. This readiness and concern is particularly apparent in Western nations as an increasing number of people reject the dominant ethic of individualism and materialism. Modern Western culture undermines, even reverses, universal values and time-tested wisdom (Eckersley, 2005). The result is a loss of moral clarity and a heightened moral ambivalence and ambiguity. Individualism places the individual at the center of a framework of values, norms and beliefs that celebrates personal freedom and choice, and materialism attaches importance or priority to money and possessions. Consequently, our human needs for security and safety, competence and self-worth, connectedness to others, and autonomy and authenticity are relatively unsatisfied when individualism and materialism predominate (Eckersley, 2005; Kasser, 2005; Hunter, 2014). In addition, there is a perception of inequity in society and corruption in business and government (Picketty, 2014; Stiglitz, 2013; Chang, 2011). The Transparency International Organization surveyed more than 114,000 respondents in 107 countries and found that over half the respondents said that corruption had worsened over the last ten years. The survey revealed a deep distrust of political

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leaders. In 51 countries around the world, political parties were seen as the most corrupt institution and 5 percent of the respondents thought government was run by special interests. Countries are scored on a scale of 0 for highly corrupt to 100. The United States was scored at 74 by the 2012 Corruption Perception Index (CPI) (www.transparency.org).

People are beginning to trust their own inner authority to seek a purposeful path, to create their own vision and to realize a sense of empowerment. Gifted and talented students with their sensitivity to social problems, seek to understand *self* and want to make a difference. This chapter introduces the concept of Spiritual Intelligence as described by Sisk and Torrance (2001) in *Spiritual Intelligence: Developing Higher Consciousness*. Selected spiritual path-finding individuals and youth who demonstrated compassion in their lives are examined to illustrate spiritual intelligence in action. Last, the chapter provides suggestions and activities to nurture and develop Spiritual Intelligence, as a viable form of giftedness. For the purposes of this chapter, spirituality and religion are not equated. A person with spiritual intelligence can practice Buddhism, Catholicism, Judaism, or any other religion, and he or she can also be agnostic or atheist (Pargament, 1999; Tirri, Nokelainen, & Ubani, 2006).

CONCEPT OF SPIRITUAL INTELLIGENCE

In the past twenty years, the concept of spiritual intelligence or (SQ) has gained momentum in popular and scholarly literature. The introduction of multiple intelligences introduced by Gardner (1983) provided an acknowledgment that other intelligences might exist. This notion stimulated a new way of categorizing and defining intelligence and paved the way for the possibility of a spiritual intelligence. Gardner (1999) suggested that intelligence may be understood as “a bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture” (p. 34). He identified eight intelligences: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist, and suggested that each intelligence functions separately as an independent system.

Emmons (2000) defined spirituality as the search for and experience of the sacred or transcendent and suggested that spiritual intelligence might be a subset of spirituality that allows an individual to use spiritual themes and abilities to solve problems. Emmons said that spirituality can be viewed as a set of specific abilities or capacities and therefore may underlie a variety of problem-solving skills relevant to everyday life situations.

Gardner (2000) refuted Emmons (2000) saying there was insufficient evidence to support the concept of spiritual intelligence. He later suggested the possibility of an existential intelligence that encompasses many of the variables considered to make up spiritual intelligence. Gardner (2003) acknowledged that the criteria for separate intelligences were judgmental and not fixed. He viewed the concept of intelligence from a reductionist lens whereas Emmons viewed it from a holistic lens.

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Emmons (2000) maintained that spiritual intelligence is what facilitates taking action in the world and using skills to solve problems in a spiritually adaptive way. Zohar and Marshall (2000) agreed with Emmons and described spiritual intelligence as the capacity to solve problems through value, vision and meaning. Vaughn (2002) extended the definition of spiritual intelligence as a “capacity for a deep understanding of existential questions and insight into multiple levels of consciousness” (p. 10).

Gardner (1999) used two classical senses of knowing: knowing how and knowing that to decide if there is a spiritual intelligence. He identified skills manifested in spiritual intelligence as meditating, achieving trance states, envisioning the transcendental, or being in touch with psychic, spiritual or noetic phenomena. Sisk and Torrance (2001) agreed with these skills and added the skills of intuition and visioning. Gardner said he did not want to risk premature closure by eliminating a set of human capabilities worthy of consideration with his theories of intelligence, so he considered the term moral intelligence instead of spiritual intelligence. Yet, Gardner said, “I do not find the term moral intelligence acceptable as long as it connotes the adoption of any specific moral code” (Gardner, 1999, p. 75), and later he wrote an article titled the case against spiritual intelligence (Gardner, 2000).

Exploration of a Foundation for the Concept of Spiritual Intelligence

Sisk and Torrance (2001) explored the concept of spiritual intelligence searching for a foundation in Psychology, Ancient Wisdom, Eastern Mysticism, and Science, as well as in the living stories of pathfinding individuals who demonstrated spiritual intelligence in their lives. From these explorations, core capacities, core values, core experiences, key virtues, symbolic systems, and brain states were identified as components of spiritual intelligence. Spiritual intelligence includes the following components.

- Core Capacities: Concern with cosmic/existential issues and the skills of meditating, intuition, and visualization.
- Core Values: Connectedness, unity of all, compassion, a sense of balance, responsibility, and service.
- Core Experiences: Awareness of ultimate values and their meaning, peak experiences, feelings of transcendence, and heightened awareness.
- Key Virtues: Truth, justice, compassion, and caring.
- Symbolic System: Poetry, music, dance, metaphor, and stories.
- Brain States: Rapture as described by Persinger (1996) and Ramachandran and Blakeslee (1998).

Paradigm Shift

A definition of Spiritual Intelligence was proposed: Spiritual Intelligence is the capacity to use a multi-sensory approach including intuition, meditation, and

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visualization to tap inner knowledge to solve problems of a global nature (Sisk & Torrance, 2001). They researched psychology for a foundation for spiritual intelligence and identified the need to search for meaning and the need to search for identity as key elements for individual achievement and fulfillment (Dabrowski, 1967; Maslow, 1971; Rogers, 1980). From science, they noted that in quantum theory, entangled particles remain connected, so that actions performed on one affect the other, even when separated by great distance. If one particle is perturbed in certain ways, the other one is affected simultaneously, and the connectedness does not depend on a signal traveling at the speed of light or slower (Greene, 1999). A thought experiment devised by three physicists and referred to as the Einstein-Podolsky-Rosen paradox verified in the laboratory that if two particles have been intimately associated and are then separated in space, they are connected nonetheless. If one is perturbed in a certain way, the other one is affected instantaneously (Greene, 1999). This quantum connection between two particles is discussed in a four part NOVA series (Greene, 2011). David Bohm (1951) observed that there is a close analogy between quantum processes and our own inner experimental thought processes. This premise in science of connectedness led to the idea that we are all connected to one another, to the earth and as Wolman (2010) suggests to the cosmos.

WHAT SPIRITUAL INTELLIGENCE IS AND WHAT SPIRITUAL INTELLIGENCE IS NOT

Spiritual Intelligence is Deep Self-Awareness

Spiritual intelligence can then be described as a deep self-awareness in which one becomes more and more aware of the dimensions of self, not simply as a body, but as a mind-body and spirit (Pert, 1997). When we employ spiritual intelligence, we reach the extraordinary place in which the mind no longer produces data of the type wanted and the need for intuition becomes accelerated. As conscious beings, we are aware of thought images and feelings as they arise in our consciousness; yet, our complex and not so complex processing of information in the brain leads to an inner experience. These inner experiences represent the essence of spirituality. As we find our inner voices, the *whisperings* of *supraconsciousness*, and go within, a spiritual connection is found (Harman, 1998). By accessing these inner processes, one can learn to nurture and to develop spiritual intelligence.

Inner Knowing

Spiritual intelligence enables us to develop an inner knowing. In the language of ancient wisdom and mystical traditions, inner knowing is to know the essence of consciousness and to realize that this inner essence is the essence of all creation. Spiritual intelligence provides access to higher consciousness in which there is

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an awareness of rapport, an awareness of being one with the universe, and all its creatures, an awareness of a knowing, a *gnosis* (Sisk & Torrance, 2001).

Problem Solving

Spiritual Intelligence enables us to see the big picture, to synthesize our actions to a greater context, which then in turn becomes life meaning. With spiritual intelligence, we can identify and solve problems of meaning and value, with solutions directed toward the benefit of all. Spiritual intelligence is not amoral, it engages us in questions of good and evil and affords us opportunities to dream, reconfigure, to look beyond the boundaries of a situation to what it could be (Sisk & Torrance, 2001; Vaughn, 2002).

Deep Intuition

Spiritual intelligence connects us with the Universal mind or Big Mind and problem solutions that come from deep intuition are for the benefit of all, not one solution at the expense of others. Through the use of spiritual intelligence, we can become integrated, if we are willing to turn over choice to the authentic conscience or to deep intuition. (Jung, 1963).

SPIRITUAL PATHFINDERS

Spiritual pathfinders aspire to achieve the highest measure of what it means to be human, and their spirituality manifests in service of others. Spiritual leaders demonstrate behaviors and beliefs that Sisk and Torrance (2001) proposed as Spiritual Intelligence. Spiritual leaders speak and act in accordance with perceptions and values reflecting a larger perspective, and their words and actions awaken the recognition of universal truths. In 1996, Mikhail Gorbachev convened a meeting in San Francisco to engage 272 global thinkers to identify core values. They identified compassion, honesty, fairness, responsibility and respect. The group concluded these values were at the heart of humanity's search for shared values. These core values were reflected in ancient wisdom and eastern mysticism (Sisk & Torrance, 2001; Sisk, 2004). The spiritual pathfinders demonstrate the power of one person being able to reinvigorate a community or a nation to restore hope and raise expectations. Through lives of service, spiritual leaders transform biological reality into a transformation of the spirit. They transform the conditioning forces of ethnicity, gender, socialization or political systems that constrain them. One major characteristic of spiritual leaders is their sense of purpose and otherworldliness, being in the world but not of it (Sisk & Torrance, 2001; Vaughan, 2002; Zohar & Marshall, 2012).

Spiritual leadership is manifested in the wisdom of the ages, and the lives of spiritual leaders leave footprints in the sands of time. Spiritual leadership is

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embedded in spirituality, but there is a distinction between spirituality and religion. The Dalai Lama in *Ethics of the New Millennium* offered this clear distinction:

Religion I take to be concerned with faith in the claims of one faith tradition or another, an aspect of which is the acceptance of some form of heaven or nirvana. Connected with this are religious teachings or dogma, ritual prayer and so on. Spirituality I take to be concerned with those qualities of the human spirit – such as love, compassion, patience, tolerance, forgiveness, and contentment. A sense of responsibility, a sense of harmony – which brings happiness to both self and others. (Dalai Lama, 1999, p. 22)

A number of spiritual leaders including Nelson Mandela, Mother Teresa, and Mohandas Gandhi manifested spirituality at an early age, and many were in stressful and challenging situations; yet, they were able to find ways to make a difference. The lives of three spiritual pathfinders are examined here as examples of spiritual leadership.

Nelson Mandela was born in 1918 in a small village in the Transkei region. His birth name was Rolihlahla, meaning pulling the branch of trees. At age seven, he enrolled in a local Methodist school, and had to change his name, spoken language, and even the clothes he wore. Early on, he became convinced that education was the road to success, and later enrolled in the all-black University College of Port Hare with 150 students representing the brightest youth of South Africa. He dedicated himself to work for racial equality in South Africa using peaceful protests through the African National Congress (ANC). Mandela earned a law degree, and started a law firm with Oliver Tambo. In 1955, the ANC drafted a freedom charter stating: *The People Shall Govern, All National Groups Shall Have Equal Rights. The People Shall Share in the Country's Wealth, and This Land Shall Be Shared Among Those Who Work It.*

Mandela was invited to the Pan African Freedom Movement meeting in Algeria, and spent 7 months of travel outside South Africa. During that time, the South African government viewed him a dangerous symbol of resistance. When he returned, Mandela was charged with inciting people to strike and with illegally leaving the country. During his trial, Mandela spoke of the grievances of black Africans:

Why is it that in this courtroom, I'm facing a white magistrate, confronted by a white prosecutor, escorted by white orderlies? Can anybody honestly and seriously suggest that in this type of atmosphere the scales of justice are evenly balanced? Why is it that no African in the history of this country has ever had the honor of trial by his own kind, by his own flesh and blood? I am a black man in a white man's court. This should not be. (Mandela, 1986, p. 326)

Mandela received a sentence of life in prison, and spent 27 years in prison. On his release, he praised the heroism of the students who had resisted, and the international community for its sanctions against South Africa. He was elected President of ANC, and showed little or no revenge, focusing on what was best for the future of the

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country. Mandela and President de Klerk of South Africa were jointly awarded the Nobel Peace Prize for their peace efforts in South Africa. In 1992, Mandela became the first black President of South Africa, and in his victory speech, he said:

I stand here before you filled with deep joy and pride in the ordinary humble people of this country. You have shown a calm, patient determination to reclaim this country as your own, and now the joy that we can loudly proclaim from the rooftops-free at last. Free at last. I stand before you humbled by your courage with a heart full of love for all of you. This is a time to heal the old wounds and build a new South Africa. (Mandela, 1998, Victory Speech online Gopher site)

Mandela demonstrated spiritual leadership in instilling the essence of peace, compassion and forgiveness in the people of South Africa.

Mother Teresa was another spiritual pathfinder. She was born Agnes Gorxha Bojaxhiu in Skopje, Albania in 1910. As a young girl, Agnes demonstrated strength, character, and purpose. She joined a student group in her local parish, and became interested in the work of the missionaries. At age 18, she joined the Irish order of the Sisters of Loreto taking the name of Teresa after St. Theresa, a Carmelite nun. Her dream was to go to India, and after learning English, she transferred to Calcutta to teach English at St. Mary's High School where she later served as principal. During World War II, scarce food and an increased workload resulted in her contracting TB, and she went to the Himalayas to convalesce, and during this trip, she heard a voice directing her to leave the school and live among the poorest of the poor.

Mother Teresa said true acts of kindness done with no selfish motive enrich the giver as well as the receiver. She identified six steps in creating a meaningful life and peace: Silence, Prayer, Faith, Love, Service, and Peace. She called this the Simple Path (Vardey, 1995). Over the years, thousands of people have been inspired by her work and taken the vows of poverty, chastity, obedience, and service to the poor. They receive rigorous training to become members of the Missionaries of Charity order established by Mother Teresa.

The order sponsors a Children's Home in Calcutta that daily feeds over 1,000 people, mostly beggars from the streets, and they care for over 2,500 patients in one week. Mother Teresa's leadership continues even after her death in 1997, with numerous requests for opening new homes from all around the world. The Missionaries of Charity have homes for AIDS in Spain, Portugal, Brazil, Honduras, and the United States including the cities of New York, Washington, D.C., Baltimore, Dallas, Atlanta and San Francisco. Mother Teresa won the Nobel Prize for compassion without condescension. Her response on receiving the Nobel Prize was, "Personally, I am unworthy; I accept in the name of the poor." Mother Teresa tirelessly worked for peace, and *In the Heart of the World* (1997), said:

Let us not use bombs and guns to overcome the world. Let us use love and compassion, Peace begins with a smile. Smile five times a day at someone you don't really want to smile at, at all. Do it for peace. (p. 13)

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Mother Teresa was an exemplar of spiritual leadership, living a life of service to others, based on love and compassion. Another spiritual pathfinder was Mohandas Gandhi.

Mohandas Gandhi was born in 1869 in Porbandar, India. As a child, he was quiet and contemplative, and early on, read the *Bhagavad Gita*, which became his calling to undertake his *battle of righteousness*. Two major beliefs directed Gandhi's life: holding firmly to deepest truth and soul force; and nonviolence to all living things. He graduated from law school, and went to South Africa to practice law, where he experienced considerable discrimination. These experiences motivated him to resolve to fight for social justice. Gandhi spent 23 years in South Africa fighting injustice, and returned to India in 1930. At age 61, he and his followers marched 240 miles in 24 days to make their own salt from the sea, an act in defiance of British colonial laws. When they reached the sea, thousands of people had joined the march, and more than 60,000 people were arrested, including Gandhi.

Gandhi became a powerful political force in India, and a spiritual leader for people throughout the world. His often quoted statement, "We must become the change that we seek," became a rallying cry for his cause (Frankl, 1985). He spun on a little hand-wheel each day, and said he was spinning the destiny of India. Gandhi was convinced that mass non-cooperation could achieve independence, and he said you cannot be dominated unless you cooperate with your dominators. His vision of independence was never realized during his lifetime, for two nations, Pakistan and India were formed out of colonial India. Civil war broke out between the Hindus and Muslims, and Gandhi was killed by a Hindu fanatic. Gandhi's spiritual leadership influenced other spiritual pathfinders, including Albert Einstein, Franklin Delano Roosevelt, and Nelson Mandela.

These spiritual pathfinders demonstrate that spiritual intelligence enables us to see the big picture, to synthesize our actions in relation to a greater context, which then in turn becomes life meaning (Frankl, 1985). Spiritual intelligence urges us to search for wholeness, a sense of community and a sense of relationship, to create an identity and to search for meaning; and out of this search for meaning comes a sense of empowerment (Sisk & Torrance, 2001; Tolliver & Tisdell, 2006; Zohar & Marshall, 2012; Wigglesworth, 2012).

CORE EXPERIENCES OF SPIRITUAL INTELLIGENCE

An awareness of ultimate values and their meaning, peak experiences, a feeling of transcendence and heightened awareness are all part of spiritual intelligence core experiences in action (Sisk & Torrance, 2001). These core experiences may by their nature seem fleeting; however, if they are intrinsic to human nature as psychologists Abraham Maslow (1971) suggested more than three decades ago in *The Farther Reaches of Human Nature*, the question becomes one of how to nurture and to develop spiritual intelligence.

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NURTURING AND DEVELOPING SPIRITUAL INTELLIGENCE

One primary way of nurturing spiritual intelligence is to bring one's life into perspective. What does this mean for the individual? You can bring your life into perspective by reflecting upon your values, perhaps by asking the big question that psychologist Carl Jung (1963) enjoyed posing to his friends and colleagues: "What myth are you living?" To develop spiritual intelligence, we need to engage in moments of inspiration or *Mountain Top Experiences* to discover the reality of the self (Seney, in press). In our fast-paced daily lives, it is important to take time to see a vision of our lives, to identify the goals and desires that we have and to create a balance in our lives. You can ask questions in a meditative quiet state, and it is important for you to believe that you will receive the answers (Wolman, 2001).

Educating for spiritual development and higher consciousness has within it the hope and goal of developing the ability of students, particularly gifted students to use their spiritual intelligence to discover what is essential in life, particularly in their own lives, and to recognize what they can do to nourish the world and to develop global awareness and global understanding. Defining spiritual intelligence as the ability to access one's inner knowledge, likely traits of spiritual intelligence are listed, as well as suggestions of ways to strengthen these traits for learning in Table 1.

ACTIVITIES TO SUPPORT AND NURTURE SPIRITUAL INTELLIGENCE

Education has the challenge that Ambrose addressed in the topical chapter of ensuring that students have the knowledge, skills and dispositions for dealing with macroproblems and capitalizing on the macro-opportunities. As with linguistic, logical-mathematical or any other intelligence, spiritual intelligence can be developed through various kinds of appropriately planned activities, which calls for assisting teachers in learning about the traits of spiritual intelligence and ways of developing them. One avenue of promise is to focus on educating higher education students, particularly those engaged in teacher education (Tolliver & Tisdell, 2006; Pingree, 2008) to lead fulfilling lives by developing their spiritual intelligence and assisting them in maximizing the likely traits listed in Table 1 to identify problems and opportunities to engage in solving them.

Several of the traits – seeking to understand self, concern about inequity and injustice, sense of Gestalt (big picture), capacity to care, compassion and concern for others, close to nature, seeking balance, and connecting with others, the earth and the universe – are addressed to provide a lens of application with suggested activities to support and to nurture spiritual intelligence. These traits are particularly relevant in assisting teachers and students in addressing macroproblems. Wigglesworth (2012) in *SQ-21: The twenty-one skills of spiritual intelligence* reiterated the importance of spiritual intelligence saying SQ can help you become more fully who you are,

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*Table 1. Likely traits and ways to strengthen for learning
(from Sisk & Torrance, 2001, p. 178–179)*

<i>Likely traits</i>	<i>Ways to strengthen for learning</i>
Uses inner knowing	Provide time for reflective thinking
Seeks to understand self	Use journal writing
Uses metaphor and parables to communicate	Read lives/works of Spiritual Pathfinders
Uses intuition	Use problem-solving (predicting)
Sensitive to social problems	Conduct service learning projects
Sensitive to a purpose in life	Use personal growth activities
Concerned about inequity and injustice	Use problem-based learning
Enjoys big questions	Provide time for open-ended discussion
Sense of Gestalt (the big picture)	Use concept mapping and thematic studies
Wants to make a difference	Provide personal growth activities
Capacity to care	Study lives of spiritual Pathfinders
Curiosity about how the world works/functions	Integrate science/social sciences
Values love, compassion, and concern for others	Use affirmations/think-about-thinking
Close to nature	Employ eco-environmental research
Uses visualization and mental imagery	Read folktales and myths
Reflective, self-observing and self-aware	Use role playing/sociodrama
Seeks balance in life	Use discussion/goal setting activities
Concerned about right conduct	Employ process discussions
Seeks to understand self	Encourage intuition and inner voice
Connected with others, the earth, and the universe	Stress unity in studies
Peacemaker	Use what, so what, now what model
Concerned with human suffering	Study lives of Spiritual Pathfinders

to continue to grow and develop, and to live with greater consciousness, direction, wisdom, and compassion. Each of the selected traits is addressed with ways to strengthen them.

Seeking to Understand Self

Parker Palmer (2000) in his book *Let your life speak* said before I can tell my life what I want to do with it, I must listen to my life telling me who I am. He suggested

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pondering the truths and values that are part of our identity, the ones by which we cannot help but live, if we are living our own life. Teachers can establish an environment that is conducive to encouraging gifted students to begin to appreciate and practice spiritual thinking by grappling with values (Kaplan, Zweiback, & Manzone, in press). One activity that students can use to build their understanding of self is to take a blank bound book and over a week or two, collect sixteen one-sentence autobiographies in the book. Students are to approach people, tell them what they are doing, and ask them to contribute to their life stories book. Upon completion of their *Book of Lives*, the students can engage in discussions with one another, note similarities and differences found in their values and truths and those of others. One sixteen-year-old shared a life story line of a female doctor who wrote, "I came, I saw and I mattered in helping people stay well." The young man said she made him feel humble, and that he wanted to matter as well. The doctor shared that she had spent two years in a kibbutz in one of the most remote areas in Israel to *pay back* prior to setting up her own practice.

Becoming aware of the self that you project to others is an important start in understanding yourself. A psychologist friend Bob Partridge asks students to think about where they think they are in their lives by drawing the hands on an empty clock face. Where would you draw the hands on the clock face in Figure 1 below?

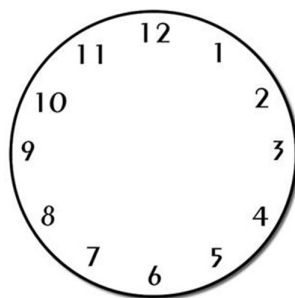


Figure 1. Clock face for self-understanding

This activity encourages reflection on goals, and sense of attainment of goals. Another engaging activity that is helpful in building self-understanding is to ask students to think of musical instruments and select one instrument. Then ask the students to choose two adjectives to describe the instrument, and write in front of each adjective, the words "I am ...". One student selected a drum and listed *loud* and *strong*. He started to laugh as he wrote *I am loud* and *I am strong*, shyly smiling, and said maybe I want to be strong.

Another strategy for developing self-understanding is journaling. Journaling helps students to become aware of their values and truths and to reflect on their growth and change over a period of time. In a three-week residential leadership program, the student's journal each night with their counselors, and at the end of the program,

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they re-read and discuss changes they note in themselves. Many of the students shared that they wrote more about others than themselves as their journal writing progressed, and that they have become more other-oriented. Effective leadership in today's world includes not only the characteristics of self-understanding, but self-acceptance and openness to personal growth and change. Service learning provides opportunities for gifted students to feel connected to their community, and promotes positive change in both the communities, and within the students (Sisk, in press).

Concern About Injustice

The co-founder of Global Exchange, Medea Benjamin, said social justice means moving toward a global society where all hungry are fed, all sick are cared for, the environment is treasured, and we treat each other with love and compassion (www.globalexchange.org). Social justice themes include understanding and valuing other cultures, economic equality, human ethics, hunger, and environmental awareness including access to water. When students are engaged in activities to stimulate awareness of social justice, they discover that in many ways people from different cultures and backgrounds hold similar values and beliefs. This helps them become aware of their own *lens of identity* and the *lens of socialization* with any accompanying stereotypes they may have inadvertently acquired. The major goal in exploring social justice themes is for students to accept and respect the differences and similarities in people.

Social Justice Jigsaw is another activity that can be used to address students' concern about injustice. First, students select a country and in teams of six students explore: (1) the history of the country, (2) its natural resources, (3) its traditions (stories) festivals and celebrations, (4) education, (5) government, and (6) music and art. Individual members of the team conduct research using the Internet and interviewing resource people, then pool their information to plan and implement a final report to be shared with the entire class. In a class of 30 students, there could be in-depth examinations of five countries with the express objectives of searching for similarities and differences, and identifying social injustice. One group of middle school students using the Social Justice Jigsaw was amazed to find numerous examples of inequity in education, and that many countries only provided primary education for students, and that some countries did not provide education for girls. The students wrote letters and sent emails to the United Nations asking for secondary education for all students; particularly, after viewing a YouTube of Malala addressing a UN task force in Oslo, Norway in which she stressed the importance of primary and secondary education being available for all students in every country.

Sense of Gestalt (Big Picture)

Combating injustice can involve real hardship and great sacrifice, and Barron (2015) shares the story of Iqbal Masih who was born in a poor Pakistani village. When his

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family badly needed money to survive, he was sold into slavery for eight hundred rupees or about \$16. Iqbal was taken to a carpet factory, chained to a loom, and made to pull threads back and forth for sixteen hours a day. It was exhausting and repetitive work. If he complained, he was beaten. Sometimes his mouth was sealed shut with tape to keep him from talking. Yet nothing could stop Iqbal from thinking about freedom for himself and for the other children forced to work this way. He knew there were laws in Pakistan against child slavery, even if they weren't always enforced. When his chains were released to let him sleep, Iqbal climbed over the factory fence and escaped. He ran to the local police station to seek help, but they took him back to the factory. The supervisors beat him to make sure he would never try such a thing again. But he did escape again and this time he found help. A Pakistani group devoted to freeing bonded laborers bought his release. Iqbal spoke out about bonded labor and urged stronger laws. He managed to sneak into a carpet factory and gather evidence of slavery and the terrible conditions, beatings and malnutrition that children were enduring. His report became a public outcry. The police were forced to raid the factory and free more than three hundred half-starved children. When Iqbal was 12 years old, he was riding his bicycle across a field when an unknown assassin fired a shotgun and killed him. Over the next several days, thousands of Pakistanis filled the streets to mourn his death. All over the world people responded to his cause and a group of students in Quincy, Massachusetts raised \$200,000 in donations to fund the Iqbal Masih Education Center in Pakistan. Barron (2015) said no one could have predicted how much Iqbal would suffer or how much good he would accomplish with his truly compassionate heart.

Teaching from a global perspective includes developing effective communication skills, teamwork and leadership to help spiritually gifted students to become international global citizens. Singh (2002) listed ten characteristics of a global citizen that can be used to check if students are able to have a sense of gestalt or the big picture. For examples, are the students reflective, well-balanced, open-minded, caring, principled, knowledgeable, risk-takers, communicators, thinkers and inquirers?

Capacity to Care, and Compassion

Service learning is an effective strategy to develop and nurture students' capacity to care and be compassionate. Service learning is described as the *power of one* since it gives students a positive means of expression and a voice. It provides them opportunities to serve and to lead, and it develops a sense of urgency and advocacy. For example, one group of high school students decided that they would plan and implement a service project for a Retirement Center in their city. They talked about what they could share with the seniors, many of whom received few or no visitors. The students decided to share their talents with the seniors; one could do incredible break dancing, another played the piano, several said they could sing duets, and one group suggested sharing their one act play with the seniors. The students visited

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the Retirement Center one Sunday afternoon and the energy between the students and the seniors was positive and invigorating. After the performances, each student selected a senior to engage in a conversation, one-on-one. On the way home, the students shared how much they had learned from the seniors, and the importance of showing love and compassion to the elders who had to leave their homes, their neighborhood and their families and to live in a new community. The Center was so excited about the positive reaction of the seniors to the students, that they asked if they could return the following Sunday, and the students eagerly agreed to visit again. One student said he felt the positive flow in the room and it made him happy to be part of it. And he added, “I don’t have grandparents, but now I have a whole room full.”

Close to Nature

Barron (2015) in *The Heroe’s Trail* said today many young people understand that we’re connected not just to other people, but to other living creatures, and that we have a responsibility to protect those creatures and become good stewards of the planet. Barron shares the example of Andrew Holleman, a 12 year old who took the *close to nature* idea to heart and acted on it. Andrew enjoyed hiking in a deep forest near his home in Chelmsford, Massachusetts where trees in the deep forest were very beautiful, as well as the wetland they sheltered. When Andrew found out that the forest was going to be leveled by bulldozers for a new development, he thought before long all those trees, plus the animals and the birds that lived in them would be destroyed. He researched what this development would really mean to his community, and learned that the sewage from the proposed development could possible contaminate the drinking water of the town. Andrew found that rare wood turtles and great blue herons, both endangered species that lived in the forest, would be threatened. He took his case to the town’s Zoning Board and after dozens of meetings and ten months, the Board voted to stop the development in the forest. Andrew learned that when people care enough and use whatever skills they have, they can make a difference.

Concern over ecology is an example of a trend moving from short- to long-term objectives. When a trend is being demonstrated, we need to consider the full implications of an act and take the long view. Concern over acid rain in Canada and the United States reflects this trend, and climate change is a global concern. To understand trends, students can discuss the following questions: When did this trend start? Has it escalated? Whom does this trend benefit? Which forces are acting to stimulate this trend? Will these forces continue?

Seeking a Balance in Life

Seeking a balance in life will help students address the hyper-materialism in our global life that contributes to environmental devastation and climate change.

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Simulation games can be used to provide students opportunities to try on new roles in an atmosphere of *safey* in the classrooms, as they explore issues with assigned roles, and then step back into their *student* role to analyze what happened. One simulation game that addresses unequal access to water is called *Water for All*. Before students engage in the simulation, they discuss four questions: (1) Why do over a billion people lack access to an abundant life-giving and vital resource like water? (2) What are the global forces and policies that shape unequal access to water in our world today? (3) What are communities around the world doing to defend their right to water? and (4) How can people living in the U.S. support social movements and communities engaged in struggles for water rights?

After discussing these questions, the students are assigned the roles, or the roles can be numbered and students can pull numbers out of a hat to identify the role they will play. The players include an agribusiness owner, a CEO of a coal company, a U.S. city resident, a small farmer, a displaced rural worker, and a refugee camp resident. The problem to be addressed is: What are the factors or forces that have shaped unequal access to water in a given area, such as Uganda or Somalia, and most important, what can be done to regain control over and access to water? First, the students research the role they are to play for a short period of time, perhaps 30 minutes, and then role-play the discussion. The agribusiness owner calls the meeting to order, then the game can be played for 10–15 minutes, and debriefed with questions including: What are you learning about control over water? What information do you need to play your role? What problems did you have playing your role? After the debriefing, the students may need time to seek further information on the Internet such as <http://www.grassrootsonline.org/publications/educationalresources/take-the-challenge> before continuing to discuss the issue. The simulation game can be reconvened for short intervals of 10–15 minutes, and the same procedure is repeated, until the students come to some agreement about suggestions on how to control access to adequate water. Grassroots International is a useful resource for students exploring environmental issues.

DEVELOPING A MULTI-SENSORY APPROACH TO PROBLEM SOLVING AND INCREASING SPIRITUAL INTELLIGENCE

The core values of connectedness, unity of all, compassion, a sense of balance, responsibility and service call for a multisensory approach to problem solving; relying not only on the five senses, but including visualization, meditation, and deep intuition. Given this premise, there are essentially seven steps to develop a multisensory approach to problem solving.

1. Think about your goals, desires and wants to bring your life into perspective and balance, and identify your values,
2. Access your inner processes and use visualization to see your goals, desires and wants fulfilled; and then experience the emotion connected with this fulfillment,

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3. Integrate your personal and universal vision, and recognize your connectedness to others, to nature, to the world, and to the universe,
4. Take responsibility for your goals, desires, and wants,
5. Develop a sense of community by letting more people into your life,
6. Focus on love and compassion, and
7. When chance knocks at your door, let it in and take advantage of coincidences (Sisk & Torrance, 2001, p. 180).

Inherent in these seven steps to develop or increase your multisensory problem solving is finding a sense of purpose and creating a vision. Once your vision is created, then there needs to be a commitment to it, followed by an intention or will to carry through toward your identified goal, desire or want. Essential to the further development of your spiritual intelligence is sensing the connectedness of everything to everything, and shifting your focus of authority and perception in life from external to internal. Essential to the development of Spiritual Intelligence is the recognition of one's relationship to the earth. The importance of earth-centered reverence and connectedness was drawn from ancient wisdom and Eastern mysticism. Among many Native American traditions, and in the Hermetic, Sufi, Zen, Tao and Confucian traditions, there is a clear emphasis on caring for the earth and being in harmony with nature.

In the seven steps to developing multi-sensory problem solving, it is important to infuse your goals, wants and desires with emotion; and this premise is based on the finding that access to unconscious processes is facilitated by attention to feelings, emotion, and inner imagery as suggested by Sisk and Torrance (2001), Wollman (2001), Eckersley (2005), Tolliver and Tisdell (2006), and Zohar and Marshall (2012). In summary, Spiritual Intelligence is not limited in the ordinary ways that you might expect the mind to be limited, since access to spiritual intelligence through the use of inner knowing can be facilitated to an extent that is ultimately unlimited. Educating for spiritual development and higher consciousness has within it the hope and goal of developing students who can use their Spiritual Intelligence to discover what is essential in life, particularly in their own lives and what they can bring to address the macroproblems in the globalized world and access the macroopportunities. In the words of Arnold Toynbee:

The ultimate work of civilization is the unfolding of ever-deeper spiritual understanding. (cited in Teasdale, 2004, p. 87)

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SECTION III

NEW PRACTICALITIES FOR GIFTED EDUCATION IN THE 21ST CENTURY

GEORGE BETTS, BLANCHE KAPUSHION
AND ROBIN J. CAREY

12. THE AUTONOMOUS LEARNER MODEL

*Supporting the Development of Problem Finders,
Creative Problem Solvers, and Producers of Knowledge to
Successfully Navigate the 21st Century*

As we look into our complex and diverse future, the need to develop autonomous learners who perceive learning and living as two main components of ongoing development in the emotional, social, cognitive, and physical domains is imperative. The Autonomous Learner Model (Betts & Knapp, 1981; Betts, 1985; Betts & Kercher, 1999; Betts & Kercher, 2009; Betts, Carey, & Kapushion, 2013; Betts, Carey, & Kapushion, 2014) consists of five dimensions and four domains supporting the development of persons who are complex thinkers, problem finders, problem solvers and producers of knowledge. These learners will successfully navigate 21st-century issues and ensure that macroproblems will be tackled and synthesized to solution through macro-opportunities. Autonomous learners are never satisfied. They perceive their needs for a nourishing life and the needs of society as their motivation. Their ability to be creative problem finders, problem solvers, and producers of knowledge will never cease. As a model of living and learning, introduced at an early age and developed throughout one's lifetime, an autonomous learner will know who they are through the Orientation and Individual Development Dimensions, know that they will continually seek life enhancing experiences in exploration and investigation through the Enrichment Dimension, debate and define their beliefs through the Seminar Dimension, and pursue passion learning in the In-Depth Study Dimension (Betts & Knapp, 1981; Betts, 1985; Betts & Kercher, 1999; Betts & Kercher, 2009). These dimensions are intertwined with the emotional, social, cognitive, and physical domains (Betts, Carey, & Kapushion, 2013; Betts, Carey, & Kapushion, 2014) leading to a lifelong learner who bridges the creativity gap in order to successfully navigate the 21st century.

It is ironic, but not surprising, that the need for autonomous learners is more important than ever. The complexity of our global society screams for citizens who can address macroproblems with creativity, thoughtfulness, multiple perspectives, and perseverance. The current state of education is focused on testing knowledge, not integration of problem finding, problem solving, and creative solution. Autonomous learners perceive learning and living as two main components of

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on-going development of potential in the cognitive, emotional, social, and physical domains. Motivation comes from within, skills are internalized, and passions are the paths of their journeys. Autonomous learners are never satisfied for they perceive their needs for a nourishing life and the needs of society (Betts, Betts, Kapushion, & Carey, 2014).

Through the five foundational dimensions of the Autonomous Learner Model (Betts & Knapp, 1981; Betts, 1985; Betts & Kercher, 1999; Betts & Kercher, 2009) and the inclusion of the four domains (Betts, Carey, & Kapushion, 2013; Betts, Carey, & Kapushion, 2014), gifted, talented, and creative learners will have the skills, knowledge, passion, and heart to be problem finders, solvers, and producers of knowledge in an effort to meet the challenges of the 21st Century and beyond. In fact, as Don Ambrose indicated "...I'm thinking the model is aligned even better with the 21st century than it was with the 20th (personal communication, October 22, 2014)."

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Feldhusen and Treffinger (1980) proposed that intellectually gifted, creatively gifted, and talented children need support and facilitation to develop their potentials. Their work took the emphasis off the development of the intellectual domain of the child and gave leaders in the field of gifted education the direction to look at all domains more than focusing solely on the intellectually gifted. In other words, they opened the field for a broader understanding of the gifted, talented, and creative. During this same time, the Autonomous Learner Model (Betts, 1987; Betts & Kercher, 1999, 2009; Betts & Knapp, 1981) was being developed. The Autonomous Learner Model (ALM) is comprised of five dimensions. Individualized needs of learners are met through the use of activities in the five Dimensions of the Model (Figure 1). These include:

- Orientation
- Individual Development
- Enrichment
- Seminars
- In-Depth Studies

These dimensions are the ultimate foundation for the ALM and in use in the current revisions of the model. By 1994, Betts and Kercher realized that the effectiveness of the ALM needed strengthening by including basic principles that needed to be addressed and followed to assure that structure and flexibility was in place so that the learner remained the focus of the programming.

Macroproblems, Macro-Opportunities, and the Autonomous Learner Model

According to Ambrose (chapter 2, this volume), "Macroproblems are high-impact, global, long-term, transdisciplinary difficulties that threaten to harm or

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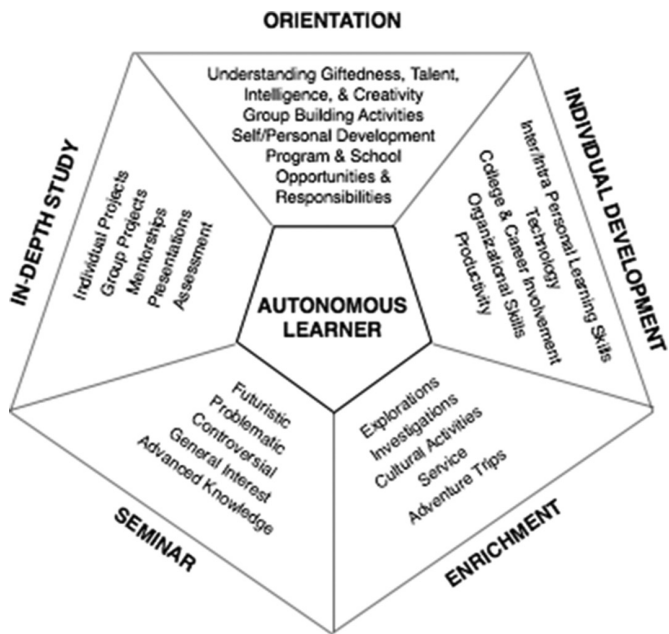


Figure 1. Autonomous Learner Model. © 1999, Betts & Kercher

even devastate the lives of billions around the world” (also see Ambrose, 2009a; Ambrose & Sternberg, 2012). As Ambrose further posits, “macroproblems are international because they cannot be solved from within the borders of a single nation; interdisciplinary because they cannot be solved from within the borders of a single academic discipline or professional field; and long term because they took decades or even centuries to create” (personal communication, June 1, 2015).

Autonomous learners develop the skills, knowledge, passions, and resilience to find and solve these issues through creative and responsible solutions. In Colorado, a debate that is under much scrutiny is that of gun safety. In Colorado’s recent history, gun related violence has caused concern for public safety, devastated families with the loss of lives and created a sense of urgency around the creation of laws or other solutions to put an end to gun violence and the unnecessary or accidental loss of life due to firearm incidents.

One individual, a high school student – an autonomous learner from Fairview High School, in Boulder, Colorado tackled this societal macroproblem. Kai Klopfer, knowing that the First Amendment to our constitution would be impossible to change, decided to design a gun trigger that would have an additional safety feature: a trigger that would only activate if the fingerprint of the registered owner to the firearm engaged the trigger. Kai’s design was presented at local and national science fair competitions and earned him engineering scholarships. Most importantly, Kai’s

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design, as a result of his moral and social concern and his ability to find and solve a problem, has brought about a high impact, global and long-term solution that will change the lives of people around the world. Kai Klopfer shared his journey of discovery, persistence, and struggle during a recent Colorado Association of Gifted and Talented state conference in a mini-keynote presentation. His ability to communicate clearly, and to share his struggles as well as his achievements, created a sense of why the ALM is imperative for the betterment of academic structures. Simply Google this young man to learn more about his journey into lifelong learning and the impact he will continue to have on our world.

Ambrose (chapter 2, this volume) also shares, “Macro-opportunities are unprecedented circumstances that can lead to significant advances in well-being for billions of individuals and to ethically guided progress for societies” (also see Ambrose, 2009a; Ambrose & Sternberg, 2012). Autonomous learners are never satisfied, for they perceive their needs for a nourishing life, as well as the greater needs of society (Betts, Betts, Carey, & Kapushion, 2014). Autonomous learners will be prepared, passionate, and ready to engage with the high level of macro-opportunities as they arise, “... lifting the vast majority of its citizens toward ethically guided self-fulfillment” (Ambrose, chapter 2, this volume). If societies don’t embrace the power and creativity of autonomous learners, they may “... move blindly forward into the trap if they are too dogmatic and ill prepared to recognize and grapple with the demands of the 21st century” (Ambrose, chapter 2, this volume) and beyond. An example of autonomous learner application is provided by Xiuhtezcatl Roske-Martinez. Xiuhtezcatl is an indigenous environmental activist from Boulder, Colorado. Xiuhtezcatl was one of the youngest speakers, at age 12, at the Rio+20 United Nations (UN) Summit in Rio de Janeiro, Brazil in June 2012. He spoke on UN panels and at many of the UN side events. He also had the honor of lighting the sacred fire with indigenous elders from Brazil. Frustrated by the inaction of world leaders, he and two other young people requested permission to speak in the UN meetings so that the voices of children would be heard.

Xiuhtezcatl is traveling and initiating International Earth Guardian Crews around the globe to fulfill the Earth Guardian mission, and these groups are now going strong in Africa, India, Australia, Brazil and Europe. Xiuhtezcatl is also a piano composer and has recorded his first album called “Journey.” His music was used in “Trust Colorado,” a short documentary featuring Xiuhtezcatl and filmed by Peter Gabriel’s organization, Witness. It won 2012 Best Environmental Film Documentary of the Year. Xiuhtezcatl also writes and performs original message-driven rap music to inspire and educate his peers through performances. Xiuhtezcatl is a living example of one of his heroes, Mahatma Gandhi, and he truly reflects the change that he wants to see in the world. Xiuhtezcatl is also a living example of an autonomous learner who is tackling ethically guided progress for our global society. To learn more about Xiuhtezcatl, explore Earth Guardians on the internet.

As a high school student at Union Colony High School in Greeley, Colorado Nurul ModhdReza became interested in sustaining and preserving the world’s

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energy needs through the use of bacteria. She developed a prototype of a specialized, single-celled microbial fuel cell. This electrochemical device produces electricity through the clarification of wastewater and assists in the evolution of biotechnology to develop a greater understanding of bacterial power production. This device will sustain the energy requirement of wastewater treatment plants all over the world. Nurul's discovery will provide energy solutions in some of the most difficult regions of our world. At the inception of her work, she did not understand the full impact of the research until she was approached by water treatment companies. This spurred her to continue with the project. Nurul illustrates the importance of exploration and investigation within the ALM. Her project is now a long-term In-Depth Study that will continue to evolve throughout her college career.

Without autonomous learners like Kai, Xiuhtezcatl, and Nurul engaging in the Dimensions and the Domains of the ALM, progress in the 21st century would be delayed and maybe even stunted. These young adults are but three Colorado examples of youth who have internalized the tenets of the ALM and are producers of knowledge. Thankfully, there are more youth throughout the world who are problem finders and creative problem solvers making a difference for mankind. It is critical that the potential of all learners be nurtured, so they are able to find out who they are as learners, discover their strengths, and develop their talents in both formal and informal learning environments.

HISTORY OF THE AUTONOMOUS LEARNER MODEL

During the 1970's, many high schools in the United States were finding that traditional methods of curriculum and instruction were not successful (Betts & Knapp, 1981; Betts, 1985; Betts & Kercher, 1999; Betts & Kercher, 2009). Students were disengaging from a learning environment that was not geared to their interests. It became apparent that there was a need to provide options for students whose emotional, social, cognitive, and physical needs were not being met.

Although not widely known, a small group had a tremendous impact on the education of the gifted. The ALM was formed by a diverse group of educational theorists: the students at Arvada West High School in Arvada, Colorado. The philosophy of the ALM was to "do it with them, and not to them." The ALM was developed "by" the students. The teachers at Arvada West realized that students knew what they needed and teachers had to revise their practice in order to participate in the educational process with the students, not teach to them. What were these students like? Some were very successful in the general education classroom curriculum, while others were struggling and even failing. A major question that emerged was, "Are the students failing, or is the system failing the learner?" As posed by Ambrose (chapter 2, this volume), are we preparing our students to address macroproblems and tackle macro-opportunities or are we preparing them to regurgitate information on standardized tests? Are we preparing our students to think creatively and critically, or are we preparing them for a world that no longer exists?

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It is fortunate that the development and implementation of the ALM gave answers and support to the fact that it may be the educational system that is failing and not the students. Given the appropriate environment, skills, concepts, instruction, and learning opportunities all students can become successful emotionally, socially, cognitively, and physically. In an effort to meet the needs within the 21st century and beyond, the goal of the ALM is the development of critical, creative thinkers who will be problem finders and solvers, as well as producers of knowledge (Tannenbaum, 1983). The ALM expands learning opportunities beyond the constraints of a curricula solely focused on the Common Core State Standards or based on outmoded instructional practices, and uses the learner voice to bring about lasting change, solve problems, and engage in creative production.

The foundational ideology of the ALM was comprised of several parts: Humanistic Psychology, including the work of Carl Rogers (1951, 1961), Abraham Maslow (1962, 1971) and Virginia Satir (1972); experiential education, including Outward Bound and Outdoor Leadership Schools; and effective team building processes. This foundation was essential in creating a positive nourishing learning environment and the development of self-directed learning. Attitudes, skills, concepts, and strategies were based on the belief that we function better when we accept others and ourselves, when we learn and work effectively and when we realize that communication skills are a major component for developing healthy and productive members of our global community. The person we would like to see develop as an “autonomous learner” is one who believes in self and others, who wants to change the world in a positive manner, and who views living and learning as a lifelong journey. Using the ALM as a foundation for affective learning, academic learning and creative production will advance in such a manner that our system will produce the critical and creative thinkers, problem finders, and producers of knowledge needed to confront macroproblems through macro-opportunities.

GUIDING PRINCIPLES OF THE AUTONOMOUS LEARNER MODEL

Betts and Kercher (1999) reviewed all components of the curriculum, instruction, assessment and learners’ products with the students through discussion, evaluations, and portfolio reviews. The revisions included the following basic guiding principles for the revised ALM:

- Emphasis is placed on the cognitive, emotional, social, and physical development of the individual.
- Self-esteem is encouraged and facilitated.
- Social skills are developed and enhanced.
- Pull-out/resource programs and special courses are necessary for total development.
- Curriculum is differentiated by the learner.
- Curriculum is differentiated by the facilitator.
- The learner is involved in guided, open-ended learning experiences.

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- Explorations, investigations and in-depth studies are developed, completed and assessed by the learners.
- Responsibility for the learning is placed on the learner.
- Students need experiences that allow them to become life-long learners.
- Teachers are facilitators of the learning process as well as dispensers of knowledge.
- Learning is integrated and cross-disciplinary.
- Learners develop a broader foundation of basic skills.
- Higher-level critical and creative thinking skills are integrated, reinforced, and demonstrated in the learning process.
- Learners develop appropriate questioning techniques.
- Varied and divergent responses are sought from the learners.
- Content topics are broad-based, with emphasis on major themes, problems, issues and ideas.
- Time and space restrictions within schools are removed for in-depth studies.
- Cultural activities and enrichment provide new and unique growth experiences.
- Seminars and in-depth studies are essential components of the learning process.
- Mentorships provide adult role-modeling, active support, individual instruction and facilitation.
- Completion and presentations of in-depth studies are integral in the learning process.
- Assessment of self-development and of learner-created products is considered necessary and worthwhile.
- All five dimensions address the unique needs of learners in a world that is consumed by social media, with immediate information, feedback, and the world accessible at our fingertips (Betts, Carey, & Kapushion, 2014).
- Inclusion of ALM in regular classroom, whole school, family and community, special experiences are needed to meet the learners' needs (Betts, Carey, & Kapushion, 2014).

The list of guiding principles will never be complete, as the world is ever-changing. Autonomous learners are more readily able to tackle macroproblems and engage in macro-opportunities to address the needs of our global society when these principles are elevated and applied to learning.

STANDARDS OF THE AUTONOMOUS LEARNER MODEL

Basic standards of the Autonomous Learner Model for the Gifted and Talented (Betts, 1985, Betts & Kercher, 1999) provide a fundamental background for the ALM. The standards are modified as the ALM continues to evolve while society presents new macroproblems and macro-opportunities. The eight standards presented here have been revised as the ALM continues to be assessed and evaluated by learners, teachers, facilitators, parents, and mentors.

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Standard 1

Autonomous Learners comprehend their own abilities in relationship to self and society to assure they are ready to meet the challenges of our global societal needs. In order to meet this standard the learners will:

- Develop an understanding of the terms “giftedness,” “talent,” “intelligence,” and “creativity.”
- Relate these concepts to their own lives.
- Understand eminent people who are seen as gifted, talented, and creative.
- Comprehend current approaches to the education of gifted, talented, and creative individuals in a global society.
- Develop definitions of ability and how it relates to potential.

Standard 2

Autonomous Learners develop a more positive self-concept and self-esteem so that they may face any opportunity presented to them with resilience and confidence. In order to meet this standard, the learners will:

- Continue to develop a deeper understanding of self, abilities, interests, aptitudes, and areas of strength.
- Develop appropriate social skills, including communication, problem-solving, decision-making, and conflict resolution.
- Critique their social skills and what is needed for ongoing development.
- Comprehend inter/intrapersonal development of self.

Standard 3

Autonomous Learners develop skills to interact effectively through communication, collaboration, and consultation. In order to meet this standard, the learners will:

- Comprehend the dynamics of the group process.
- Apply the dynamics of group process to their environment.
- Comprehend different group roles, which facilitate or deter group development.
- Assess the dynamics of the interaction of the small and larger groups within the class.
- Understand the importance of developing skills, concepts and attitudes for lifelong learning.
- Participate in activities developed to provide the skills, concepts and attitudes for lifelong learning.
- Demonstrate the skills, concepts and attitudes that have been presented in this area.
- Comprehend the importance of organizational skills in their lives.

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- Explore the organizational skills they believe they already possess.
- Develop organizational skills they believe they will need for future development.

Standard 4

Autonomous Learners increase knowledge in a variety of passion areas. In order to meet this standard, the learners will:

- Demonstrate the ability to select a topic that is meaningful to them.
- Successfully complete group and/or individual enrichment activities.
- Comprehend the process of an investigation.
- Verbally or visually convey what was learned and how it was learned.
- Successfully complete an investigation.
- Comprehend, share, and reflect on the process of completing an investigation.

Standard 5

Autonomous Learners develop critical and creative thinking skills. In order to meet this standard, the learners will:

- Comprehend critical and creative thinking.
- Apply critical and creative thinking to explorations, investigations and discussion groups.
- Create Seminars and In-Depth Studies that involve the use of critical and creative thinking.
- Continue to analyze the use of critical and creative thinking in everyday life.

Standard 6

Autonomous Learners discover and develop individual passion area(s) of learning. In order to meet this standard, the learners will:

- Comprehend the process of an In-Depth Study:
 - Select a “passion” area for an In-Depth Study.
 - Design a learning contract for the In-Depth Study.
 - Participate in the In-Depth Study.
 - Create ongoing and final presentations demonstrating what has been experienced and what has been learned in the In-Depth Study.
 - Evaluate and reflect on personal participation and assessment of In-Depth Study.
- Become a practicing “professional” within the “passion” area.
- Receive appropriate feedback from involved audiences concerning the In-Depth Study.

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- Develop appropriate products that are visual, oral, kinesthetic, written and technological.
- Incorporate appropriate products into passion areas of learning.

Standard 7

Autonomous Learners integrate activities that facilitate responsibility for their own learning in and out of the school setting. In order to meet this standard, the learners will:

- Develop an entrepreneurial mindset.
- Comprehend the importance of college, career, and workforce involvement.
- Comprehend the importance of local and global societal issues.
- Explore and complete college and career projects in areas of interest.
- Participate in on-going cultural activities.
- Comprehend the basic format of a Seminar.
- Select interest topics in the areas of futuristic, problematic, controversial, general interest, and advanced knowledge.
- Develop, present, and assess complete Seminar(s).
- Receive feedback from appropriate audiences concerning the Seminar(s).
- Demonstrate lifelong learning skills through informal projects outside of school.

Standard 8

Autonomous Learners ultimately become responsible, creative, independent, lifelong learners. In order to meet this standard, the learners will:

- Seek feedback from facilitators, peers, mentors and other appropriate audiences concerning lifelong learning activities.
- Participate in on-going “service” activities within the community.
- Focus on passion learning as the highest level of learning.
- Develop, participate, complete, present, and assess on-going Seminars and In-Depth Studies throughout life. Include appropriate products that become a capstone of the content, process and product.
- Comprehend the concept of lifelong learner and complete several Seminars and In-Depth Studies that provide opportunities for problem finding, creative problem solving and the production of new knowledge, ideas or products.
- Commit to the goal of being one that can impact the world in a positive direction through your abilities, your skills and your ability to communicate and work in collaboration with other learners.
- Facilitate others in their quests of becoming ...

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Changing Roles from Teacher-Directed to Learner-Facilitated Within the ALM

Through these guiding principles and standards, learning is facilitated within the ALM. It is not to be assumed that learners come to the table with or without these skills fully developed. There is a process to teaching/learning and learning/facilitating. As facilitators of the ALM, knowing the learner is essential to optimal engagement. The role of the facilitator is to take the ceiling off so the learner will flourish.

As seen in Figure 2 and Figure 3, the role of the teacher shifts to that of facilitator while the student shifts to learner, taking charge of the learning process. This begins with the Orientation Dimension and progresses through the other four dimensions of the ALM, culminating with the Capstone Project(s) of the In-Depth Study. All five dimensions must be included to ensure a fully functioning autonomous learner.

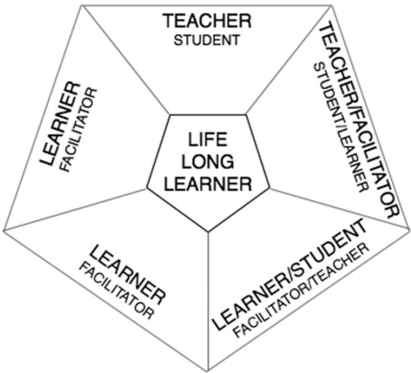


Figure 2. Changing roles in the ALM. © 2009, Betts & Kercher

Personal Growth Plans

Many educators are involved in the development of an Individualized Learning Plan for the student. Parents may be included as the plan develops, but the student is often left entirely out of the process, or they are shown the plan after it has been completed. With the Personal Growth Plan (PGP) (Betts, 1985; Betts & Kercher, 1999) learners receive a basic format and are responsible for modifying it to be meaningful to their own interests and areas for growth. With the teacher/facilitator, other teachers and parents, the learner develops her/his own three to six month PGP. The final decisions of the plan are made by the learner. The plan consists of activities and strategies within the four domains: emotional, social, cognitive, and physical and the five dimensions of the ALM: Orientation, Individual Development, Enrichment, Seminars and In-Depth Study. The plan is updated whenever there is need for revision by the learner.

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Table 1. Progression for changing roles in the ALM

<i>Teacher/Student</i> (Orientation Dimension)	<i>Student/Teacher</i> (Individual Development Dimension)	<i>Learner/Facilitator</i> (Seminar Dimension In-Depth Study Dimension)
	<i>Learner/Facilitator</i> (Enrichment Dimension)	
<ul style="list-style-type: none">• Curriculum designed by the teacher• ALM is taught to students• Learner begins to develop Personal Growth Plans with input from the teacher.	<ul style="list-style-type: none">• Learner develops Personal Growth Plan with input from teacher• Learner skill development is enhanced with input from teacher• Learner presents Personal Growth Plan to develop skills, concepts and attitudes• Learner engages in Explorations and Investigations	<ul style="list-style-type: none">• Learner assesses, modifies, and implements Personal Growth Plan with emphasis on demonstration of learning• Learner designs and completes a Capstone Project and presents to authentic audience• Learner engages in assessment and self-reflection of the learning experience

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Updated Definition of the Autonomous Learner

Autonomous learners perceive learning and living as two main components of their ongoing development of potential in the cognitive, emotional, social, and physical domains. Their motivation comes from within, they internalize skills, and passion learning is their driving force. Autonomous learners are never satisfied, for they perceive their needs for a nourishing life, as well as the greater needs of society (Betts, Betts, Carey, & Kapushion, 2014).

Revised Autonomous Learner Model

The ALM includes the foundational Five Dimensions, which include Orientation, Individual Development, Enrichment, Seminars, and In-Depth Study and introduces Four Domains of the self: Emotional, Social, Cognitive, and Physical. The model encompasses multiple activities in which the learners participate. The four domains were added to address the internal components of a fully functioning individual. The autonomous learner is intentionally in the center or “heart” of the model (Figure 3) with the four domains integrated in each of the five dimensions of the ALM (Figure 4).

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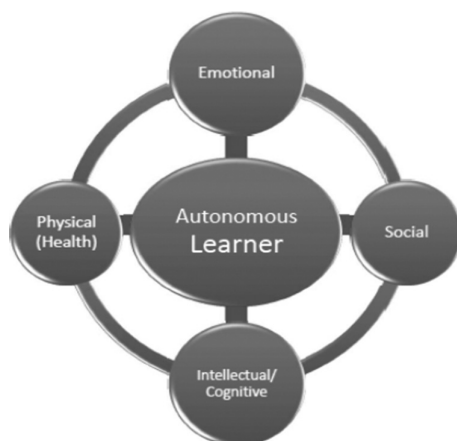


Figure 3. Four domains of the ALM. Betts, Carey, and Kapushion (2013, 2014)

Emotional: intrapersonal – how do learners process information, arrive at solutions, and learn about self to the point of self-acceptance and self-efficacy, so they can begin to look beyond self to the macroproblems and possible solutions?

Social: interpersonal – how do learners interact with others effectively and collaboratively, through personal and professional relationships? Relationships are enhanced through unconditional positive regard, collaboration, communication, and consultation.

Cognitive: intellectual – how do learners seek knowledge, engage in formal and informal learning opportunities, and become problem solvers and producers of knowledge?

Physical: health and well-being – how do learners recognize the importance of the physiological and psychological well-being and commit to fulfilling their ongoing journey?

The five dimensions of the ALM are intertwined with the cognitive, social, emotional, and physical domains to provide experiences that lead to the development of diverse, lifelong, autonomous learners.

Dimension one: Orientation. The Orientation Dimension of the ALM provides learners the opportunity to develop a foundation of the concepts of giftedness, talent, intelligence, creativity and the development of passion and potential. Learners discover more about themselves and their abilities, and develop who they are as problem finders, creative problem solvers, and producers of knowledge. Activities are presented to give learners an opportunity to work together as groups, to learn about group process and interaction. These global community-based skills increase communication, consultation, and collaboration, imperative in 21st-century societies.

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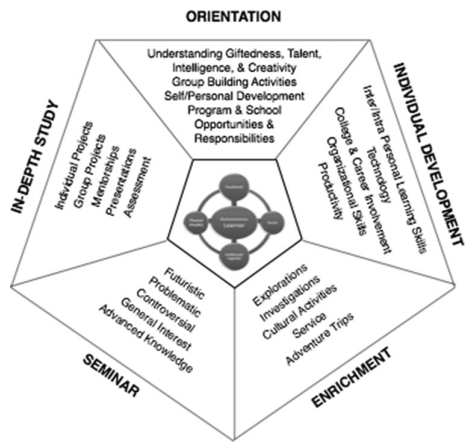


Figure 4. Five dimensions of the ALM © 1999, Betts and Kercher; Four domains of the ALM. Betts, Carey, and Kapushion (2013, 2014)

Dimension two: Individual development. The Individual Development Dimension of the ALM (Figure 5) provides learners with the opportunity to integrate the emotional, social, cognitive and physical skills, concepts, and attitudes necessary for lifelong learning. Areas within this dimension include opportunities for inter/intrapersonal development of learners, the appropriate learning skills for lifelong learning, participation in college and career involvement, and the development of organizational skills that will lead them to be productive citizens of the world.

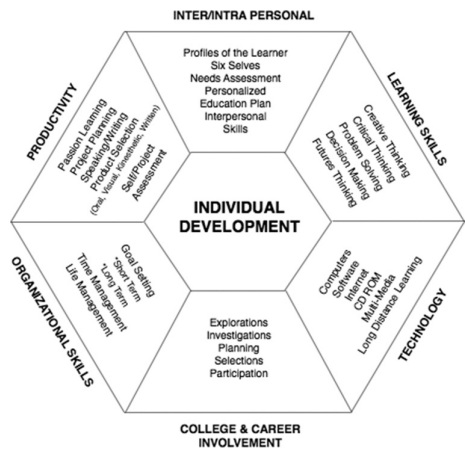


Figure 5. Individual development dimension of the ALM

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Dimension three: Enrichment. The Enrichment Dimension of the ALM provides learners with opportunities to explore content and curriculum that are not ordinarily part of the prescribed school curriculum. The highest level of learning is manifested when learners have the freedom to select and pursue content in their own style and within their own passion area. This is true whether it is school-based formal learning, or outside of school informal learning. Curriculum differentiation by the learners begins with Explorations, where the goal is to explore and find new and unique knowledge in a variety of methods, laying the foundation and freedom for learners to become problem finders and creative problem solvers. The second type of learner differentiation is Investigations, where learners take a topic or idea they have explored and investigate it further. Learners take the lead in sharing the production of new knowledge while facilitators provide support throughout the process.

Dimension four: Seminars. The Seminar Dimension of the ALM is designed to give learners, in groups of three to five, an opportunity to research a topic and present it as a Seminar to an appropriate audience. A Seminar format is essential because it allows learners to be creative problem finders, problem solvers, and producers of new knowledge or ideas, which is essential in living and learning in the 21st Century. This type of problem based learning and presenting provides learners an opportunity to practice essential skills that will assist them in becoming successful contributors within our complex society. In the Seminar Dimension learners engage in the following conceptual areas:

- Futuristic – passion areas investigated within a futures perspective
- Problematic – problems impacting the learner and other members of society
- Controversial – ideas and topics seen as controversial for some people, but not for others
- General Interest – opportunities that present aspects of a passion area that may provide benefit to society
- Advanced Knowledge – learners will expand the knowledge, depth, and complexity of their own areas of passion.

The Seminar Dimension is a powerful learning experience that brings autonomous learners together in the collaborative process, engaging in the skills needed to become problem finders, creative problem solvers, and producers of new knowledge. Through engagement in a Seminar, learners realize the benefits of teamwork as they prepare for living, learning, and flourishing in the 21st century

Dimension five: In-depth study. The In-Depth Study Dimension of the ALM empowers learners to pursue long-term topics of passion and/or social concern. The learner determines what and how they will learn, how the learning will be presented, and what facilitation will be necessary. It is the goal to find and solve problems,

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gain new insights, and possibly create or obtain new knowledge. There are six components to the In-Depth Study:

- Individual Projects – The majority of In-Depth Studies are completed by individuals.
- Group Projects – Group projects are common in Explorations and Investigations, and occasionally, learners may want to continue this work in the form of an In-Depth Study.
- Mentors – Learners work with a mentor during all phases of the study. Learners benefit greatly by engaging with mentors for knowledge, direction, advice, and new suggestions for the study.
- Product – The product can take many forms: written, oral, visual, or kinesthetic. It is the synthesis of the In-Depth study and includes what the learner learned and experienced. Both the facilitator and mentor can provide guidance in the formation and finalization of the product.
- Presentation – The learner will determine how, when, and what format the presentation will take. The audience may include professionals in the field of study, interested classmates, teachers, and parents. The presentation may be offered multiple times in multiple venues. The atmosphere and setting will be determined by the learner, as needed to fit the tone of the presentation.
- Assessment – The assessment of the learning includes learner reflection and self-evaluation. Audience members may provide feedback on the presentation and product, as a component of the assessment. The process of the learning is as important as the product of the learning.

With the integration of the five dimensions and four domains of the ALM, both formal and informal learning opportunities can and will address the needs of the whole child as a passionate and motivated learner. With curriculum focused on concept-based learning rather than rote memorization, the application of skills and knowledge through the principles and standards of the ALM will anchor knowledge in lifelong learning: learning that is meaningful to a complex and ever changing global society. It is through the development of lifelong passionate learners that our education system will be reformed and our world will become a better place. A competent education system should be measured on the number of healthy, creative and engaged learners. With limitless opportunities available through technology, learners are more adept at solving problems and creating new ideas in global teams or as individuals using a variety of resources and forging relationships with mentors through the process. The learners are able to efficiently process new knowledge to produce solutions and address macro-opportunities with confidence and resilience.

CONCLUSION – A CALL TO ACTION

Acknowledging that our current education system should be preparing learners for a future that is complex and ever changing, it is critical that learners graduate with

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knowledge, skills, concepts, and attitudes that are flexible, creative, and dynamic. The skills needed are those of 21st century-learners. The need to develop autonomous learners who perceive learning and living as two main components of ongoing development in the emotional, social, cognitive, and physical domains is imperative. The development of the whole child who sees the promise of macro-opportunities to address the macroproblems of society as they arise is the foundation of the ALM. The Seminar and In-Depth Study Dimensions of the model ensure the learners have a solid foundation for this endeavor. This is our moral obligation and call to action.

For the past 50 years, Dr. James Gallagher relentlessly advocated for changing school systems in order to remove limitations for learners who have been trapped by a society that focuses on the past rather than looks toward the future. Gallagher opened doors to define possibilities for the education of the future and development of autonomous learners.

Failure to help the gifted child is a societal tragedy, the extent of which is difficult to measure but which is surely great. How can we measure the sonata unwritten, the curative drug undiscovered, the absence of political insight? They are the difference between what we are and what we could be as a society. (Gallagher, 1975)

For those who may wonder how we can facilitate this type of learning environment in the continual age of standardized testing, we evoke the brilliant mind of Dr. Seuss in his book, *Hooray for Diffendoofer Day!* (1998). This poignant story paints a picture of the purpose of education in light of the testing and accountability mindset in the “No Child Left Behind” era. As the doom and gloom attitudes arrive with “testing season,” Miss Bonkers puts all fears to rest:

‘Don’t fret!’ she said.
‘You’ve learned the things you need
To pass that test and many more –
I’m certain you’ll succeed.
We’ve taught you that the Earth is round, That red and white make pink,
And something else that matters more – We’ve taught you how to think’ (p. 26).

The students at the Diffendoofer School need not have worried about the upcoming mandated tests. Because they had been taught to think, they “got the very highest score!” (p. 30).

Since 1976, Betts and his colleagues have worked toward the same mission. Autonomy in education and the development of autonomous learners has made a resurgence in the educational reform circles. The ALM has supported many learners over the past forty years and is more important now than ever. Our world and society is changing rapidly. The need for our education system to develop problem finders, creative problem solvers and creators of new ideas and knowledge is imperative so that macroproblems and macro-opportunities can be addressed for the betterment of our world. It is the responsibility of our education systems to develop learners who

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think creatively and critically, who analyze and synthesize information and data, who can suggest new ideas and put those ideas into action.

In order for this call to action to be realized, education systems and education reformers must understand the elements of the ALM: the five dimensions, four domains, guiding principles and standards, and implement them so that the learners are educated as whole-child learners. The ALM was developed, implemented, evaluated and today is redesigned by the learners. The ALM is a practical model because it belongs to the children and youth of today who are yearning to be lifelong, 21st-century learners. All begins with teachers becoming facilitators of learning, focusing on learner strengths and passions, increasing engagement and motivation in learning through the building of skills, concepts, and attitudes and allowing learning to be relevant.

This shift to learner-driven programming has been happening for some time in a number of classrooms, schools, and districts; however, the change is not widespread. In order to realize this shift in our schools and education systems more broadly, we suggest engaging in some initial steps to ensure readiness:

1. Build readiness with administrators at the building and district level. Without the support and understanding of educational leaders, any new approach is not likely to take root.
2. Provide the foundational skills necessary for teachers to move to facilitators. As teachers engage in professional learning opportunities and see the real possibilities the ALM opens for the learners, they will embrace the approach and become effective facilitators of learning rather than dispensers of knowledge.
3. Engage the learner voice from the start. Learners welcome the opportunity to design their own learning pathways; however, it is critical to provide scaffolding when necessary to ensure the best possible outcomes.
4. Most importantly, trust that the learners of today are ready and quite capable of moving forward in this way. Connection at a global level is at their fingertips; creative thinking processes fuel their communication. Let the learner soar!

When education systems and education reformers embrace the possibilities and get out of the way of what learners can do and produce, macroproblems will be tackled, and macro-opportunities will be addressed to provide solutions and produce creative ideas for the betterment of our global society.

Remember E. Paul Torrance's Manifesto for Children:

Don't be afraid to fall in love with something and pursue it with intensity.

Know, understand, take pride in, practice, develop, exploit, and enjoy your greatest strengths.

Learn to free yourself from the expectations of others and walk away from the games they impose on you. Free yourself to play your own game.

Find a great teacher or mentor who will help you.

Don't waste energy trying to be well-rounded.

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Do what you love and can do well.

Learn the skills of interdependence. (Torrance, 1983)

The ALM was developed, implemented, evaluated and today is redesigned by the learners. The ALM is a practical model because it belongs to the children and youth of today who are yearning to be lifelong, 21st-century learners. Without the involvement and leadership of these learners, education will continue to be based on the principles and standards of education of the 20th century. Twenty-first-century learners go beyond teachers and schools because they know their journeys are within their own potential.

George Betts, (2012, ©) captured a major goal of autonomous learning in the following:

*Some people have the ability
to create excitement in their lives.
They are the ones who strive,
Who grow,
Who give and share.
They are the ones who love.
They possess passion ...
For themselves, others,
Nature and experiences.
They have the ability
to see beyond today,
to rise above the hectic pace,
to strive for their own perfection ...
And they are gentle,
for they love themselves,
and they love others ...
Through their living,
they create peace and contentment.
At the same time,
they create excitement,
for there is always another mountain,
a deeper joy,
A new dawn ...*

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13. CREATIVITY AND INNOVATION

The Twin Pillars of Accomplishment in the 21st Century

The focus of the field of gifted education for many years has been on how to promote creative behavior in the absence of concern about innovation. Skills necessary for innovation, which lie in the acquisition and mastery of domain-specific and technical knowledge coupled with the application of those skills to interdisciplinary problems in the real world, often are not developed sufficiently to allow innovative outcomes. This chapter lays out the distinctions between the two concepts of creativity and innovation, how they manifest themselves in our belief systems and in our exemplars of success. The chapter suggests the need to adapt the focus of program development for the next century of working with gifted learners to an emphasis on innovation that might apply to any field of endeavor in addition to demonstrating the inherent interdisciplinarity of learning at the highest levels. Inherent in the discussion is the role of standards, the role of teaching, and the role of collaboration and how each is acknowledged in the innovative more than in the creative endeavor. Implications are drawn that might influence future research and school-based practice and policy.

INTRODUCTION TO THE CONCEPTS

What do we mean by creativity and what by innovation? Are they the same or different processes? Both constructs demand proof in the real world, the final test of acceptance of an idea or a product by peers and ultimately by a broader audience of consumers. Both also require a set of skills that combines critical thinking with creative thinking and problem-solving behaviors to be successful. Both also require non-intellective traits such as motivation, perseverance, and autonomy. Both constructs also demand of an individual heightened motivation and the desire to design and develop products that work. The passion to create becomes a central driving force on the road to creativity and innovation. Moreover, individuals who create and innovate must also be extremely hard workers, devoting large amounts of time to the projects they are working on. Finally, people who create and innovate must have a deep knowledge base in their field of endeavor in order to be playful and experimental with the content.

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Yet innovators have additional requirements. They must be pragmatic and see how the innovation fits into the real world of existing products and ideas. They must see the product as feasible for use in a given field. Thus innovators are concerned about implementation and application of ideas, not just ideas themselves. They also are visionary, seeing the potential for an idea within an existing market or identifying how to move in the right direction within a field, based on subtle environmental cues. It is through the timely application of products or ideas in systematic ways that positive change occurs in a business, a classroom, or even a society. This is the primary job of innovators – bringing a product or idea to the real world and making it work over time and in many places.

CONTEMPORARY EXAMPLES

Sometimes creators and innovators are one and the same, as in the case of Edison, who invented and marketed his discoveries. More often, they are different people. Companies have design teams who pass on the product to an implementation team of marketers, distributors, and sales staff who make the product appealing, affordable, and necessary for consumers to purchase. Collaborative teams of creators and innovators represent another way to think about the two constructs working together. Theorists, researchers, and practitioners working together can create models of research in practice (Dai, 2011) where the theory may drive design and practice but may also work in reverse, with practice causing a theory to be reworked. In the world of gifted curriculum, collaboration between content specialists, curriculum developers, and gifted specialists yielded stronger products than would have been created with only one kind of expertise applied to the problems of design (VanTassel-Baska & Little, 2011).

Steve Jobs and Steve Wozniak both were creative and innovative, yet Jobs became and stayed the CEO of Apple because he had superior innovative skills and understood the importance of marketing new products successfully. He also was more driven and motivated to succeed in the world of business than Wozniak. He was an entrepreneur in the best sense of the word, having a vision for change in the multiple industries of computing, electronics, animation, and music.

In the field of gifted education, we have stressed the development of creative producers but not necessarily innovators. Is the preparation the same or different? Is the preparation of innovators counterproductive to traditional schooling models? After all, both Bill Gates and Steve Jobs were college dropouts, both attending very selective institutions where many of the students are gifted. To what extent are the habits of mind associated with innovation different from those employed by a creator? By the age of 12, Bill Gates had taught himself the world of computing to a level at that time only known by fewer than 50 people worldwide. Steve Jobs taught himself the business of animation and then refined it into a company called Pixar, a move that no one else had thought to do. Clearly schooling was not an impetus for this kind of knowledge acquisition or use (Isaacson, 2011).

THE SPECIAL CASES OF CHARLES DARWIN AND SIR FRANCIS GALTON

In the history of eminent individuals, we see the seeds for much innovative activity—the autodidact is common among poets, writers, artists, and even scientists. It would be fair to say that the father of gifted education, Sir Francis Galton, was himself an autodidact, inventing statistical operations, research methods, and a whole line of inquiry on the inheritance of ability. His cousin Charles Darwin also was an avid autodidact, teaching himself on the HMS *Beagle* the strategies he needed to observe animal and plant life in the Galapagos. I would argue that Darwin was a creator while Galton was an innovator, living to shepherd and see his ideas to fruition and established in schools and hospitals around England. His pragmatic interest in application of his ideas was never far from his mind, as attested to in his letters, while Darwin was more consumed with seeing his ideas get published and letting others make the applications (VanTassel-Baska, 2014).

In the lives of each of these men, raised as part of England's gentry class in the 19th century, the role of education was secondary and on an "as needed" basis to their desire to understand and apply their knowledge in the real world. Driven by a rage to know and a relentless motivation to delay gratification, each came to contribute to the world, albeit at different levels of influence and impact. The work of the innovator may be important at a local level but not easy to generalize to all contexts and time periods. For Darwin, his theory became highly generalizable as multiple applications of evolution came to be seen. For Galton, whose work was more atheoretical, although heavily influenced by Darwin's theory, the practical applications were buttressed by an active research agenda.

So is another distinction between the two the capacity to generate theory as well as do research and apply it to practice? Creators come up with paradigm-shifting ideas that are well articulated for others to apply. This is Kuhn's notion of how science progresses—by the big ideas of a few who gather adherents and then have others apply those ideas in the way of normal science to test their validity. Kuhn saw science as revolutionary in this respect, with new ideas having the gravitational pull to change a field and its research agenda. Others, of course, saw science as more evolutionary, the "standing on the shoulders of giants" image, which was most commonly held.

What are the features of creators that don't apply to innovators and vice versa? Perhaps Table 1 may be instructive. These distinctions between creators and innovators assume that they are not the same person. They also assume that creators are rarer than innovators in any field. For example, in education as an applied field, the number of innovators at all levels of the enterprise of schools and universities far exceeds the number of creatives who develop theories to impact the thinking about a construct. Our premiere theory-builder and creative in the field of gifted education, Bob Sternberg, has taken upon himself the task of trying to do it all—beyond theory to research and development. Yet even he stopped short of engaging in implementation realities. Many others have used application in schools as

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their playground, spurred by the edicts of the Javits Act, which required research, development, and implementation insights to be a part of the grants.

The contention that creators and innovators differ in their assumptions about the nature of knowledge, about the purpose of their activities, and the habits of mind they bring to the enterprise, does suggest that the epistemological orientation of creators is distinctive from that of innovators. Creators assume that learning itself is enough, that it is idiosyncratic, and that it is tentative. Innovators, on the other hand, see knowledge as instrumental in the service of the greater good of a society, or a profit margin, are collaborative and dynamic in their work leading to product outcomes, and they are utilitarian in their vision. Dominant in the habits of mind of creators is skepticism, objectivity, and curiosity, while innovators practice systems thinking, flexibility, and pragmatism. The outcomes of creative endeavors often are a change in a paradigm in a field, the creation of a new theory for viewing a phenomenon, often accomplished by an individual working alone on an idea. The outcomes of an innovator, on the other hand, are new products that change practice in myriad ways.

Table 1. A comparison of creators and innovators

Creators	Innovators
<ul style="list-style-type: none">• Change basic paradigms in a field.• Create theories as a way to explain ideas in a connected way.• Work alone to articulate ideas for dissemination.• Prefer working on theory and researchable questions in the problem solving process.• Possess the habits of mind of curiosity, skepticism, and objectivity.• Assume that learning is idiosyncratic, based on prior knowledge and relevant skills and motivation.• Assume that ideas and knowledge have independent currency.• Assume that knowledge is tentative and can be reshaped for deeper understanding of a phenomenon.	<ul style="list-style-type: none">• Change the world of practice, using new paradigms.• Create products that illustrate theories.• Work collaboratively to bring products to scale.• Prefer working on problem solving from the multiple levels of theory, research, development, and implementation.• Possess the habits of mind of pragmatism, systems thinking, and flexibility.• Assume that knowledge can be transformed into an endless variety of products that respond to the needs of people and institutions.• Assume that learning is collaborative and dynamic, creating its own momentum in <i>medias res</i>.• Assume that ideas and knowledge only have currency in the real world.

IMPLICATIONS OF THE DISTINCTIONS FOR SCHOOL-BASED LEARNING

If creators and innovators differ in the ways I am suggesting in this chapter, then perhaps schooling models need to be sensitive to the distinction as well in how we approach optimal learning. Gifted education has always recommended acceleration

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by grade, independent study, and advanced placement in levels of learning (e.g., university classes early) as the most fruitful patterns to pursue for the highly gifted who are the most likely to become the creatives of the next generation (see Park, Lubinski, & Benbow, 2006). While such approaches have shown powerful effects on individual creative productivity, they have not necessarily produced innovators who will influence the practical applications of creation. Perhaps we need to consider a schooling model that honors the 21st-century skills of collaboration, communication, critical and creative thinking, problem solving, and metacognition to a greater extent than before. I would argue that our research on creativity has always supported such a direction. If we examine the research on creativity and then on innovation, we observe areas of common emphasis but also areas that diverge.

CREATIVITY RESEARCH IN GIFTED EDUCATION

Over the past two decades, studies have continued to suggest the relationship between critical thinking and reasoning to high-level creative production within and across domains (Csikszentmihalyi, 2000; Gardner, 2000). In gifted education, becoming a creative producer in the real world is predicated on the acquisition of a combination of creative thinking, problem solving, and critical thinking within a domain (VanTassel-Baska & Little, 2011). Sternberg's (2011) successful intelligence model also suggests that combinational skills are essential, ones that are analytic, creative, and practical.

While earlier studies have shown that students display important gains in content-specific higher order skills such as literary analysis and persuasive writing in language arts (VanTassel-Baska, Avery, Hughes, & Little, 2000) or designing experiments in science (VanTassel-Baska, Bass, Reis, Poland, & Avery, 1998), studies have only recently demonstrated that a content-based intervention provided students with enhanced generic critical thinking and reasoning skills at the elementary level (Bracken, Bai, Fithian, Lamprecht, Little, & Quek, 2003; VanTassel-Baska, Bracken, Feng, & Brown, 2009). Other Javits projects, focused on working with low-income students, have also promoted the use of higher-level thinking within content areas (Gavin et al., 2007; Swanson, 2006) with positive results.

Most K-12 programs for gifted students include some components of critical thinking as a fundamental part of the curriculum (Chandler, 2004). Only recently, however, have we begun to test the efficacy of curriculum with respect to student growth in this area at various stages of development. We have been satisfied instead to use proxy outcome data like Advanced Placement (AP) and International Baccalaureate (IB) scores, SAT scores, or even state tests to tell us how well these students are performing at higher levels of thought (VanTassel-Baska & Feng, 2003).

The teaching of creativity, however, is not as prevalent in classrooms due to the emphasis on standards and accountability that do not assess or value the development of creative skills. Still, some evidence suggests that educational programs based on appreciation for creative-thinking abilities may in fact facilitate the creative process

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in learners over time. Two longitudinal studies have attempted to link creatively oriented gifted programs to later adult productivity. Delcourt (1994) studied 18 secondary students who were identified by Renzulli's Three Ring Conception of Giftedness and were provided with Type III enrichment activities three years after completing a creatively oriented gifted program. All of the students were found to be satisfied with the nature and extent of the project work with which they were engaged (see Delcourt & Renzulli). Moon, Feldhusen, and Dillon (1994) studied 23 students who participated for at least three years in an enrichment program using the Purdue Three-Stage Model of creative development. They found that all of the students planned to attend college and 78% planned to undertake graduate training. The study noted that aspiration levels for girls were tempered by interest in marriage and children. Other types of study designs have been used in attempts to correlate creative performance in adulthood with creativity test scores in childhood. Cramond (1994), for example, studied the lifetime productivity of individuals identified at elementary ages by the Torrance Tests of Creative Thinking as having creative potential. Results demonstrated that lifetime creative achievement was moderately correlated with the test scores. Two other variables were found also to have important correlational value: an enduring future career image during childhood and a mentor at some time.

Torrance (1993), in a related study, reported on two exceptional cases of "beyonders" who outperformed any prediction of their success in the adult world. He found that these individuals possessed such characteristics as love of work, perseverance with tasks, lack of concern with being in the minority in any work group, enjoyment of working alone, and immersion in work-related tasks. It is interesting to note that all of these characteristics are highly related to the ethics of intrinsic motivation, individualism, and work.

RESEARCH ON INNOVATION

Much of the research on innovation and the gifted has emerged from the work of Shavinina (2003, 2009) that demonstrates how the construct of innovation has been applied to gifted education. Her work has emphasized the importance of multiple factors to be nurtured in students, drawing from instructive real-world case examples. These factors include the development of entrepreneurial abilities, managerial talent, and time- management strategies, as well as affective characteristics like courage. Root-Bernstein (2003), to cite another example, sees the major task of new fields of science to be innovative in that basic science must be wedded to the practicalities of technology in the real world in order for it to be useful to a society. The science that underlies genetics and its application to medicine is but one of many examples that illustrate his ideas.

Innovation is the clarion call of the new National Science Board report, which calls for priming the pipeline for scientists, technology specialists, engineers, and mathematicians (STEM) who can solve the real-world problems we face as well as

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provide a competitive edge for America. In the past decade, several other national reports have called for increased STEM education, including suggestions for earlier intervention, foci on the most able children, and renewed interest in the importance of spatial ability for STEM innovation. In particular, the National Science Board (2010) details the lack of STEM preparation in schools and outlines an agenda for action in their report, *Preparing the next generation of STEM innovators*. The report notes that, while many others have made recommendations focusing on raising overall performance of America's students, few have "focused on raising the ceiling of achievement for our Nation's most talented and motivated students" (p. 4). The National Science Board further outlines key issues, including the importance of early intervention and sustained support for talented learners. They note that talent for the sciences often is overlooked and that spatial ability is rarely measured or developed in school. Cited in the report, the Business Roundtable (2005) suggests that the problems cannot wait to be addressed:

One of the pillars of American economic prosperity—our scientific and technological superiority—is beginning to atrophy even as other nations are developing their own human capital. If we wait for a dramatic event—a 21st-century version of Sputnik—it will be too late. There may be no attack, no moment of epiphany, no catastrophe that will suddenly demonstrate the threat. Rather, there will be a slow withering, a gradual decline, a widening gap between a complacent America and countries with the drive, commitment and vision to take our place. (p. 5)

In another national report, *Rising above the gathering storm* (2007), the National Academy of Sciences (NAS), the National Academy of Engineering, and the Institute of Medicine elucidate that point in terms of the future prosperity of the United States:

This nation must prepare with great urgency to preserve its strategic and economic security. Because other nations have, and probably will continue to have, the competitive advantage of a low wage structure, the United States must compete by optimizing its knowledge-based resources, particularly in science and technology. (p. 4)

This report notes that STEM, particularly the technological advancements that it encompasses, have driven the U.S. economy for the past several decades. The authors conclude that the highest priority must be to improve K-12 science education. The National Research Council (2007) reflects that, while standards-based reform has been underway for more than 15 years, improvements in U.S. science education have been lackluster, especially in comparison with other countries. They argue that, "At no time in history has improving science education been more important than it is today" (p. 1). The need to improve science education is great, but part of the solution may lie outside the traditional classroom.

The National Academy of Education (NAE) white paper, *World-class science and mathematics* (2009), affirms this, suggesting that STEM education is vital for the

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security and economy of the United States. Despite this well-known importance, the United States has yet to make a concerted effort in schools to provide quality STEM education in the post-Cold War era. In the book, *Taking Science to School* (2007), the National Research Council (NRC) analyzed the available data and concluded that the United States is seriously behind in science education. This lack of STEM focus is seen in higher education and the job market, which has an ever-increasing need for highly educated people capable of filling the openings (Shea, Lubinski, & Benbow, 2001). While employers expect to hire 2.5 million STEM workers between 2004 and 2014, there is a national shortage of students graduating from institutions of higher education with degrees in many important STEM fields (American Competitiveness Initiative, 2006).

Given the demand for highly educated people in STEM fields coupled with the fact that they earned about 70% more than the U.S. average in 2005 (Terrell, 2007), it may be surprising that too few people choose to pursue STEM fields in higher education. The reason can be found long before higher education begins. Students who do not prepare well during their K-12 education will likely have a tougher time getting into and succeeding in STEM at the university level. Data from international studies (see Fleischman, Hopstock, Pelezer, & Shelley, 2010) continue to show the United States ranked well below other countries, raising the question of how well we are focusing on an innovative agenda in schools. Countries like Singapore continue to overtly pursue the development of entrepreneurs and innovators, even giving awards to the best each year in this new area of emphasis, while the United States does little to pursue an active agenda for its most talented students in STEM areas.

So what is the foundation for preparing leaders who can become the entrepreneurial innovators of tomorrow? The agenda for development depends heavily on the systematic use of different modes of thinking and problem solving, grounded in the real world of problems, issues, and themes. Just as our traditional approaches to teaching creativity have centered on the creative skills of fluency, flexibility, elaboration, and originality and models such as Creative Problem-Solving (CPS) that put them together (Isaacson et al., 2000; Treffinger, Isaacson, & Torval, 2000), so now we must add the skills associated with design and engineering in an environment of collaboration where the focus is a common often ill-structured problem. And how can this happen, given the challenges of current schooling and the fractured nature of our field?

THE ROLE OF STANDARDS

In a standards-based environment, as contemporary schools are, it is important to integrate the knowledge and skills of innovation into the required standards that need to be addressed and assessed. Current efforts have been made to differentiate the new standards in math, language arts, and science for use with gifted learners

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(see Johnsen & Ryser, 2014; Hughes, Kettler, Shaughnessy-Dedrich, & VanTassel-Baska, 2014; Adams, Cotabish, & Ricci, 2014). While these guidelines make the standards more appropriate for advanced learners, they also are geared toward developing the skills of innovation through a project-based learning model that honors the development of collaborative research projects, the presentation of data findings, and the articulation of what they mean in all subject areas. These skill sets are central to the enterprise of innovation where thinking and doing are interchangeable processes in the world of learning. Thus the new standards may be seen as important points of departure for the nature and level of learning required to develop high-level skills in the gifted.

THE ROLE OF ETHICS IN THE DEVELOPMENT OF TALENT

Perhaps in the consideration of the development of creative and innovative talent, it is important to contemplate the underside of such deliberate development in the absence of ethical values (Ambrose, 2011; Bulloch, 2011). We can end up creating monsters – human beings who have lost their very humanity to the thrill of the search for answers to the latest puzzle or the solution to constructing the best mousetrap. While current business school preparation stresses the use of moral values in decision-making, too often they are seen as the organizational values that go unquestioned (Anteby, 2013). In education, often teachers do not see themselves as moral agents even as they espouse moral perspectives (Lee, Chang, Choi, & Kim, 2012). Thus it may be critical to consider ways to infuse the need for ethical and moral leadership in students who have the ability to make societal contributions on a grand scale. These students may benefit from a curriculum that includes the use of moral dilemmas, case studies of others who have used their work in questionable ways for self-glorification, and an emphasis on the development of emotional intelligence, which allows them to understand and express emotions in themselves and others while also learning to channel such emotions for altruistic purposes (Dixon & Moon, 2014). In science education, Hodsden (2003) has advocated the use of issue-based curriculum, culminating in political action. The infusion of these topics and skill sets will be a critical part of building programs for high creatives and innovators alike.

TEACHING TO HIGHER-LEVEL SKILLS

To teach the higher-order process skills of critical thinking and creativity to gifted learners is to engage them in lifelong learning skills that provide the scaffolding for all worthwhile learning in the future (Beyer, 2000; Elder & Paul, 2004). It is “teaching them to fish,” not providing merely one fish to be eaten for only a day. This constructivist approach to learning, however, requires similar approaches to be employed by the teacher, requiring long-term investment in learning new ways to

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think as well as teach. Because higher-order thought and creativity is not formulaic, it requires being open to the moment, asking the probing question at the right time, engaging the class in the right activity based on when they most need it, and assessing levels of functioning with regularity. Constructive teaching also requires teachers to provide students with useful models in order to have schema on which to hang their ideas. However, even useful models cannot be taught mechanistically; they must be thoughtfully applied and used idiosyncratically by gifted learners so that the greatest benefits accrue. Finally, teachers must help students understand that real thinking is hard work, that it takes effort over time to improve, and that the outcome is frequently uncertain.

COLLABORATION

Innovation as it is practiced in the real world is a team sport while creativity is still viewed as an individual one. The role of engineering and design in the application of ideas to real-world problems is a central tenet of innovative organizations, requiring people with different skill sets working together to solve the problems at hand. Many STEM initiative schools offer a course to students even as early as elementary level in basic design where they create a product for use in the real world that works, teaming with others to develop it and beta test it, and then redesign as needed. This collaboration is essential to problem resolution where the best fit is found, given the exigencies of deadlines, cost restrictions, and miscalculations.

Through problem-based learning, students experience the floundering of not knowing what to do as they assume ownership of the problem, and they must gather data to move the problem forward via a metacognitive “Need to Know Board” that records their questions and tentative answers (Gallagher & Stepien, 1996; Boyce et al., 1997). Yet students don’t know how to collaborate without practice and developing the skills of empathy and listening to others. Thus our programs in schools need to ensure that gifted students have the opportunities for collaborative learning organized around real-world questions of design. Products need to be developed that meet real-world specifications that can be justified; articulation of ideas and concepts that guided the design work also need to be a central mode of communication about the project, mapping the processes employed to explore central ideas.

However, I am not suggesting that schools abandon the development of creative talent in favor of innovative talent. Rather both are important to nurture in a society. The natural proclivities, personality, and interests of students will likely influence the paths of talent development that they follow. The role of educators is to provide opportunities and guidance, based on available data on student aptitudes, interests, and values. Innovation in the absence of important creative work at its core is mere technical skill; thus both sets of abilities need to be consciously addressed and developed in programs for the gifted.

CONCLUSION

Gifted education, if it is to be seen as relevant in the next decades, must adopt an agenda that presses on the teaching and learning associated with real-world innovation and change. It must embrace the use of technological tools that enhance the application of ideas in all fields. It must systematically teach the higher-level skills of thinking and problem solving as routine ways to instruct in all disciplines. It must promote the use of collaborative and dynamic ways to learn that stress options and alternatives over linear paths to a given end. It must promote the use of higher-level questions both by teacher and by the learner to scale up the inquiry process. Finally, it must acknowledge that the goal of 21st-century learning for the gifted is innovation, not just creativity. We need people who have the vision to use the tools and strategies ethically, resulting in inventions that elevate the quality of life for all.

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14. NAVIGATING TALENT DEVELOPMENT BY FULFILLING GAPS BETWEEN GIFTED POTENTIAL AND PERFORMANCE

Fulfilling gaps between gifted potential and actual performance is a major concern for many parents and educators as well as gifted students. The major challenges posed by the 21st-century trends and issues are magnifying the importance of addressing these gaps. Underachievement is typically defined as the discrepancy between individuals' potential and actual performance/achievement (Baum, Renzulli, & Hébert, 1995; Colangelo, Kerr, Christensen, & Maxey, 1993; Lupart & Pyryt, 1996; Rimm, 1997, 2008). It becomes one of the matters of vital importance in gifted education because it leads to a big loss for both gifted students and the entire society should it remain unresolved (Davis, Rimm, & Siegle, 2011). However, research has mostly focused on issues regarding identification, diagnosis, and factors leading to underachievement, and little has yet revealed efficient interventions to reverse it. Moreover, most of the literature has mainly attributed underachievement of gifted students to unsupportive environmental issues involving their family, peers, and schools (see Davis, Rimm, & Siegle, 2011; Rimm, 2003 for summary) and dismissed that gifted students are vulnerable to underachievement owing to their diverse learning characteristics.

A large volume of literature has documented a wide variety of cognitive and affective characteristics of gifted students (Clark, 2013; Davis, Rimm, & Siegle, 2011; Reis & Housand, 2008). Generally, gifted students are reported to have characteristics that contribute to high performance and achievement in school. For example, they are highly motivated, self-disciplined, comply with the rules and requests from teachers, and do not need help with study skills because they can manage on their own (Gentry & Kettle, 1998). Due to the perception that gifted students can accomplish anything they put their minds to, it is believed that gifted students are able to surmount underachievement if they work harder and get organized (Gentry & Kettle, 1998). However, gifted students are diverse learners, showing distinctive learning profiles with different strengths and weaknesses in various content areas, which may also lead to underachievement.

Teachers get confused when they observe a student's giftedness but the student does not show performance and achievement as high as the perceived ability. Students who do not demonstrate outstanding performance are generally unrecognized in

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the identification process of gifted students, which deprives them of being served appropriately by educational services they need for talent development. Identifying diverse needs of gifted students is worth examining to understand the academic characteristics and learning behaviors that lead to underachievement for the gifted. It also enables teachers and parents to design and implement follow-up educational interventions, such as effective learning strategies, to help gifted underachievers to overcome their learning difficulties.

In order to address the aforementioned needs, this chapter proposes a typology of gifted learners who are likely to be vulnerable to underachievement. Based on a comprehensive review of literature regarding underachievement and gifted students, 13 types of potential gifted underachievers are identified. Issues regarding cognitive style, academic motivation, sensitivity, behavioral issues, and relationships with teachers, peers, and parents are the major criteria that generate each type of underachiever. This chapter discusses academic strengths and weaknesses of each learner and suggests a wide array of learning strategies tailored to the needs of the learners. Suggested strategies allow students to increase their understanding of learning materials and teacher presentations (Eggen & Kauchak, 2013) and promote academic achievement. Reducing discrepancies between unidentified and/or unfulfilled giftedness, and achievement is one way to foster the talent development of gifted students who have great potential to become future leaders.

GIFTED LEARNERS WHO ARE POTENTIALLY UNDERACHIEVING

Thirteen types of prospective gifted underachievers are identified using the following criteria: cognitive style, axis of relationships, academic motivation, sensitivity, parental control, and deviation. Learning strategies are suggested with foci on optimizing strengths and compensating for weaknesses of each type of learner.

GIFTED LEARNERS BY COGNITIVE STYLE

Three types of learners – analytical, creative, and adaptive – are identified according to cognitive style. In the triarchic model of intelligence, Sternberg (2000, 2003a, 2005) suggested three types of intelligence, analytical, synthetic, and practical intelligences and later referred to them as kinds of intellectual giftedness (Sternberg, 2003b). Cognitive style is interchangeably used as learning, thinking, and/or problem solving styles¹ (Eggen & Kauchak, 2013; Ormrod, 2014) and involves both cognitive tendencies and personality characteristics (Zhang & Sternberg, 2006).

Analytical learners are typically considered as sequential and convergent thinkers, while creative learners are somewhat the opposite type, mostly holistic, intuitive, and divergent thinkers. Adaptive learners are similar to practical learners, who have strengths in applying and generalization, showing a combined profile of analytical and creative learners.

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Analytical Learners

Analytical learners are logical, sequential thinkers and skillful problem solvers who show excellent organizing skills both on learning materials and time. They are good at comparing and contrasting ideas, understanding cause and effect relationships, and making judgments. They also show advanced reasoning ability and higher-order thinking skills. Similar to the ones with schoolhouse giftedness (Renzulli, 2005), they are teacher-pleasing students who are excellent test-takers and high achievers. Their strengths lie in coordinating learning materials, grasping main ideas from reading, time management, and self-control ability. Mostly as prize students who are punctual and keep track of tests and assignments, analytical students set specific goals to pursue for learning, monitor and progress through learning with study plans and organizers. Yet, their weaknesses are in inflexibility and stubbornness. They do not feel comfortable going beyond normality, have difficulty thinking outside the box, and adhere to simple facts and concrete ideas to get to one best solution.

Learning strategies. Analytical learners perform well on tasks and assignments that include sequences, clues, structure, instructions, and a definite solution. Study strategies, such as storing information using a planner, an organizer, and a summary note, and drawing inferences using prior knowledge, are effective in enhancing students' reading comprehension skills and metacognitive ability (Thiede & Anderson, 2003). Making questions consisting of keywords and core concepts from reading can help them to elaborate their logical, analytical thinking and to organize and retrieve information. Good organizational skills enable the students to connect prior knowledge with new information, transfer from old to new ideas (Eggen & Kauchak, 2013; Wood et al., 1999), and make information internally meaningful to them to facilitate their memory skills (Anderson, 2005; Craik, 2006; Mayer, 1996). Using a concept map in sequence that contains the main idea from a class reading also helps them to put pieces of information into a broader context (Eggen & Kauchak, 2013). Strategies that allow students to produce a variety of ideas and flexible thinking patterns can promote creative thinking. One example is the True-North principles that consist of activities designed for deferring judgment, generating ideas, recording ideas, and elaborating or improving upon the ideas (Michalko, 2001). Idea-spurring queries, such as SCAMPER (substitute, combine, adapt, modify, put to other uses, eliminate, rearrange/reverse), attribute listing, and morphological synthesis, etc., are other examples (Starko, 2005). Collaborative work, brainstorming, and brainwriting (Osborn, 1953) are instrumental for facilitating both the divergent and convergent thinking abilities of analytical students. Also, team-based learning can be applied to elevate interdependence among peers and to cultivate creative and critical thinking as well as problem-solving skills (Michaelsen, 2002).

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Creative Learners

Creative learners are intuitive, divergent, and synthetic thinkers. They are curious, inquisitive, insightful, original, adventurous, and risk-taking. They prefer to solve undefined problems, resist or ignore typical rules and orders, try new things, and interpret and solve problems in a novel way. They have many ideas and diverse interests, do not adhere to plans, tend to see the entire forest rather than paying attention to smaller pieces of leaves, and show strengths in grasping the overarching theme from reading materials (see Davis, Rimm, & Siegle, 2011; Reis & Housand, 2008 for summaries). Interestingly, at school, creative students are not usually high achievers as students with creative-productive giftedness (Renzulli, 2005). They are not well-disciplined, lack impulse control ability, and show extreme levels of energy (e.g., high or low) depending on their interest areas. For example, they are not motivated to do schoolwork that does not interest them but can sustain attention over a long period of time on what they are passionate about. Due to the inconsistent pattern of concentration on academic work, grades vary by subject matter according to interest. Creative students are likely to be careless and make technical errors related to calculation, spelling, punctuation, capitalization, sentence structure, and more. Some students show attention deficit hyperactivity disorder (Cramond, 1994; Runco, 2007 for a summary).

Learning strategies. Creative students are not generally welcome in class because teachers perceive them as nonconforming and problematic. They, on the other hand, have the potential ability to perform at their optimal level when they are supported to get into their own interest areas. MURDER (Dansereau, 1978), standing for mood, understanding, recalling material without referring to the text, digesting material, expanding knowledge by self-inquiry, and reviewing mistakes, can be used as effective learning strategies for divergent thinkers. Strategies favored by analytical learners, such as the use of note taking and planners, may also help to compensate for the weaknesses of creative learners. For example, note taking using graphs, figures, and charts in color helps them to stay focused in studying and improves memory (Hartley & Davies, 1978; Vanderstoep & Pintrich, 2003). Keeping a written record of ideas was found to help creative people, such as Leonardo da Vinci and Thomas Edison, to dwell on and elaborate ideas, and transfer the ideas from one situation to the other (Michalko, 2001). Also, using a planner and keeping a diary enable creative students to organize time and learning material through reflecting on their learning process (Do & Yang, 2011; Kim & Do, 2012; Zimmerman, 1998). Other possible learning strategies include RAINS (read the entire question, analyze the context, identify keywords, notice the negatives, and search for grammatical clues; Minskoff & Allsopp, 2003) and the sequencing (short-medium-long) tool that lists discrete tasks to be carried out, specific timelines, and the individuals responsible

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for the task (Treffinger, Schoonover, & Selby, 2013). Both are useful particularly for students who are disorganized, easily distracted, and often make mechanical mistakes in taking tests.

Adaptive Learner

Adaptive learners are interested in real-life issues and applying learning to practical uses. They are good at employing learning strategies from one situation to the other, putting a theory into practice, and relating prior knowledge to new ideas. They are skillful, efficient problem solvers and performers as well as good communicators. Other strengths include favorable peer relationships and leadership ability. However, adaptive learners often solve problems too promptly and without sophistication, prefer to discover clues over repeated deliberation, and take shortcuts in dealing with problems. Generally, they are clever and wise but they can also be impatient, crafty, and lacking in tolerance for failures due to their tendency to achieve without much effort.

Learning strategies. Situational learning is helpful for adaptive students. They are efficient problem solvers in everyday situations where people reason intuitively based on daily experiences with problem solving (Choi & Hannafin, 1995). Using real-life examples and factual evidence, teachers are able to encourage students to relate reading material to personal experiences in their daily lives. For example, students learn numbers, fractions, and calculations not only from textbooks but also from hands-on experiences at a local grocery store. Using a material (tangible) reinforcement, such as a token reinforcer, is suggested as a way to initiate their learning (Ormrod, 2014). A token-economy strategy designed to reinforce desired behaviors with a token and use it to trade for backup reinforcements (e.g., objects or privileges students choose) would strengthen students' interest in learning (Ormrod).

For adaptive learners, the Creative Problem Solving (CPS) model (Isaken et al., 2011; Treffinger et al., 2006) helps to promote critical, creative problem-finding and solving abilities (Treffinger, Schoonover, & Selby, 2013). CPS involves practical and future-oriented problems with stages of understanding the challenge (i.e., problems), generating ideas, preparing for action, and planning an individual approach (e.g., applications) that fit in well with these learners. Similarly, participation in Future Problem Solving (Torrance & Torrance, 1978) can enhance students' communication skills, teamwork, and leadership ability as well as their creative and critical thinking skills. A problem-solving strategy that follows a sequential-learning procedure from understanding the problem, devising a plan, carrying out, and looking back (Polya, 1962) would also help them to grasp underlying principles and apply these to practice.

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GIFTED LEARNERS BY AXIS OF RELATIONSHIPS

Two types of learners are included according to the axis of relationships with significant people in school: a teacher-centered learner versus a peer-centered learner. The former places a high priority on forming good relationships with teachers, has a strong desire to be acknowledged by the teachers, and does not like working apart from them (Lewis & Reinders, 2007). The latter is highly aware of and sensitive to peer relationships, motivated by a peer group, and prefers to collaborate with peers.

Teacher-Centered Learner

Teacher-centered learners are hardworking students who are anxious to get recognized by teachers. They are willing to follow teachers' instructions, comply with their requests and expectations, and concentrate on classes and grades. They prefer to sit up front close to teachers and enjoy interacting with the teachers. They are also good assistants to teachers in class because they generate appropriate questions and answers, and tend to be teacher-pleasers who think of teachers as role models. Teachers should understand that these students may lack intrinsic motivation for learning and achievement. They may ask questions mainly to get attention from the teachers but lose interest in classes and grades when perceiving negative attitudes from them. Students' overdependence on and great awareness of teachers can do harm to their peer relationships.

Learning strategies. Social reinforcement by teachers through gestures and/or other signals has a significant impact on these students. Students concentrate on learning when they perceive teachers' involvement and support (Davis, 2003; Furrer & Skinner, 2003; Roeser, Eccles, & Sameroff, 2000), and this can be magnified for teacher-centered students. Teachers' attention, approval, and praise are significant social reinforcers that urge students to perform better and make progress in learning, especially when the teachers provide specific guidance and feedback about their learning (Hattie & Timperly, 2007; Ormrod, 2014; Ryan, Ormond, Imwold, & Rotunda, 2002; Shute, 2008). Teachers should support the students' mastery of learning goals by helping them to establish short-term, self-referenced goals; attribute success to effort and learning; and recognize improvement, progress, and mastery in evaluating their learning outcomes (Ames, 1992). Coaching (e.g., providing students with frequent suggestions, hints, and feedback) and modeling (e.g., having students' attention while teachers perform the task and demonstrate a desired behavior) are other strategies suggested to facilitate positive learning behaviors (Ormrod, 2014). Demonstrating how to build study habits, keep track of assignments and schoolwork, and monitor learning behaviors are examples of effective coaching strategies for this type of learner.

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Peer-Centered Learner

Peer-centered learners can be either individual-centered or group-centered. Individual-centered peer learners have an intense and intimate relationship with a few close friends to whom they confide secrets, while group-centered peer learners have a large group of supportive friends with whom they interact and feel comfortable. These two are different in terms of the number of close confidants but are similar in that peers have a great impact on their learning and school life. Overall, peer-centered learners are popular among friends, have a sense of humor, and form good peer relationships. They are highly conscious of what peers think and expect of them, and are influenced academically and psychologically by a peer group to which they belong. Peer relationships enhance positive attitudes toward school and students' academic achievement if the students are surrounded by an academically supportive peer group. Because of high reliance on peers, however, they tend not to comply with teachers' requests unless approved by their peer group. This leads to a conflict with teachers, particularly if the students mingle with poorly-behaved peers who have no interest in academic work. The students, for example, can disrupt classes by personally insulting teachers and embarrassing them with aggressive behaviors in order to gain support from their peers. They can be the victims of bullying in school as well.

Learning strategies. Pairs check, a cooperative learning strategy, is suggested to facilitate learning for these students. It involves students working in pairs with one student solving a problem, and the other monitoring and coaching the problem-solving procedure and encouraging his/her partner. The students take turns and check if they have the same answers as their peer (Kagan, 1989). Attention and approval from peers are generally reinforcing (Bowers, Woods, Carlyon, & Friman, 2000; Grauvogel-MacAleese & Wallace, 2010), and more so for students who are peer centered. Therefore, peer modeling, and cooperative and collaborative work with like-minded peers are effective strategies to be considered. Conversely for students who are negatively influenced by peers, a time-out session can be applied by placing them into a separate room. For about 2 to 10 minutes in timeout, students are not allowed to interact with other students and thus gain no reinforcement. In-school suspension which separates students from peers by placing them in a quiet, boring room in the school building can also be included as an option unless a timeout works. During the suspension, students spend the whole day conducting assignments and schoolwork with no interactions with other students. It is particularly effective when a teacher supervises students with support for academic work and gives specific instructions to promote appropriate behaviors (Nichols, Ludwin, & Iadicola, 1999; Ormrod, 2014; Piffner et al., 2006).

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GIFTED LEARNERS BY ACADEMIC MOTIVATION

This chapter identifies two types of potential underachievers, passive versus helpless students, based on their level of academic motivation. Being passive is associated with a low level of perceived cognitive competence, which is likely to disrupt the process of learning and social skills (Paulsen, Bru, & Murberg, 2006). Helpless learners are greater at risk because they view the causes of negative events as internal to themselves, stable over time, and global in effect (Nolen-Hoeksema, Girgus, & Seligman, 1986).

Passive Learners

Passive learners can have a low level of intrinsic motivation but high extrinsic motivation for learning. Academic achievement can be either low or high, yet as students advance to higher grades, their achievement is likely to decrease. These students prefer structured learning environments with clear instructions and rules. They are not confident in their ability to perform independently, have difficulty solving problems they are not familiar with, and seek help from other people instead of digging into the problems on their own. They preserve academic self-esteem by avoiding complex learning situations. Due to the deficit of self-regulation, they can stop studying when frustrated by low grades and experience with academic failures, avoid learning situations, and show resistance to academic tasks. Passive learners do not activate prior information and knowledge nor do they have their own plans and skills they feel confident in employing for learning.

Learning strategies. Students are likely to build self-efficacy by observing the success and failure of other students who are perceived to have similar ability (Chen & Morris, 2008; Schunk & Pajares, 2005). Having students interact with a classmate model would inspire their motivation for learning and achievement. Starting with a study planner and a time organizer helps passive learners to be aware of and monitor their learning process. Notepads, graphic organizers, self-talk (e.g., verbalization), and visualization are other study skills that encourage the students to get engaged in learning.

There are various modes of strategies that focus on promoting self-regulated learning. Metacognitive ability is crucial for active learning (Pintrich, & De Groot, 1990). It is defined as thinking about thinking (Mather & Goldstein, 2001) and involves student's awareness of information, knowledge, skills, strategies, and overall cognitive processing. Metacognitive strategies provide an example of self-regulated learning strategies suggested for passive learners. Planning, monitoring, and modifying cognition; management and control of efforts on academic tasks; and implementing cognitive strategies to learn, remember, and understand the material are some of the methods that enhance metacognitive ability (see Pintrich & De Groot, 1990 for a summary). Students are able to learn self-regulated problem-solving skills

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via identifying possible solutions, predicting potential consequences, choosing the solution, understanding the process of implementation, taking action, and evaluating the results (Ormrod, 2014; Yell, Robinson, & Drasgow, 2001). Other strategies include activities for goal setting and planning, attention control, self-monitoring (e.g., observation, assessment, recording, modeling), self-instruction (e.g., repeating self-talk), and self-reinforcement (e.g., reward for desired behaviors, withholding reinforcement for undesired behaviors). These are some options that teachers may want to employ in order to motivate passive students to become responsible for and independent in their learning (Meichenbaum, 1977, 2000; Zimmerman & Risemberg, 1997).

Helpless Learners

Helpless learners have no interest in studying and are prone to avoid learning situations. Classes and grades are not important and school is boring. They have low self-esteem and self-efficacy, and feel like nothing makes them excited and enthralled. They are unmotivated and dispirited overall but can intensely concentrate on one thing (e.g., computer games, physical activity) that inspires them and makes them feel competent. The students are very quiet in class, lying on their face throughout the class, and seem to be indolent, inattentive, and reluctant. They need constant prompting and guidance when studying and learning (Minskoff & Allsopp, 2003). Their helplessness affects not only their school performance and achievement but also their daily lives. Helpless students also can be aggressive in order to draw attention from teachers and peers.

Learning strategies. Experiencing a success in school is crucial for helpless students to boost their academic motivation, build positive self-concept, and reverse underachievement. Having significant people (e.g., parents, teachers) praise them and provide them assurance that they can achieve to the extent that they work hard is important. Teachers ought to understand students' level of academic preparation (e.g., knowledge, skills, experience, etc.) and provide them with appropriate curriculum and learning activities that effectively promote success on academic tasks (Ormrod, 2014). Given that helpless learners are prone to avoiding learning situations, computer-based learning, such as using video clips and games, are effective for igniting their learning (Kim, 2002; Lee, 1999). Positive and supportive messages from teachers help, as does introducing a coping model from peers who have been through similar issues but overcame them (Kitsantas, Zimmerman, & Cleary, 2000; Zimmerman & Kitsantas, 2002). Particularly from a coping model, the student can learn strategies that the model uses to gain proficiency and apply them to learning (Ormrod). Increasing collective self-efficacy via applauding a group to which the student belongs is another strategy to motivate the student and enhance self-efficacy in class (Ormrod). Lastly, teaching to repeat self-instructions that facilitate learning behaviors is an effective strategy for helpless students. Following Meichenbaum's

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(1977) five steps of self-instruction for example, students are allowed to see a teacher performing a task; perform the task while listening to the teacher verbalize instructions; repeat the instructions aloud; whisper the instructions; and think about the instructions while performing the task.

GIFTED LEARNERS BY SENSITIVITY

Gifted students show an intensified manner of interacting and experiencing with environments (Piechowski & Colangelo, 1984). They are intensive socially and emotionally as well as intellectually (see Clark, 2013; Davis, Rimm, & Siegle, 2011; Reis & Housand, 2008 for summaries). Dabrowski pinpointed the positive side of this heightened intensity or arousal as a developmental force and proposed five modes of psychic overexcitabilities (OEs), including intellectual, imaginative, emotional, sensual, and psychomotor OEs (Dabrowski & Piechowski, 1977; Piechowski & Colangelo, 1984). Generally, academically gifted students have advanced intellectual acumen, as do creatively gifted students showing a high level of imaginative sensitivity. Given that the globalized 21st century needs individuals who are committed to making a better society, it is important to understand multifaceted attributes of giftedness, including non-intellective sensitivity, that promote creative leadership to benefit individuals and society as a whole. Yet, little is known about gifted students and/or underachievers with non-intellective sensitivity. This chapter examines two types of potential gifted underachievers by this mode of sensitivity: sensual and emotional learners.

Sensual Learner

Sensual learners have a sharp sense of sound, sight, touch, smell or taste, and enjoy experiencing sensual pleasure although all senses do not equally contribute to their learning and knowledge acquisition (Sousa, 2006). They show characteristics similar to those of the students having sensual overexcitability and partly to those with psychomotor and imaginal overexcitabilities (Piechowski & Colangelo, 1984). They are inquisitive, have a keen sense of observation and imagination, and often use images and visualization in making associations. They like to use sensual (e.g., visual, auditory, textual) materials, generate ideas through using multiple senses, experiment, and have hands-on experiences. For teachers, these students seem to be out of control. Because they are eager to sense, feel, and touch in person, they can delay classes unless they understand learning materials and activities physically and substantially. They are prone to boredom when sitting in class, and feel burdened with structure, instructions, and rules imposed on them by the teachers. Due to their sensual sensitivity, they are often perceived as fastidious and bizarre.

Learning strategies. Applying the five senses, particularly visual-spatial senses, to learning stimuli is suggested for this type of learner. Visual-spatial literacy enables

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students to interpret and create conceptual models that represent complex issues in the current society (Ambrose, in press). Particularly, an increasing demand for STEM (science, technology, engineering, and mathematics) expertise requires advanced visual-spatial talent (Ambrose; Root-Bernstein, 2015). For students who are sensitive to visual-spatial materials, images, figures, maps, graphs, diagrams, and charts are effective study tools. Specifically, 2-D and 3-D visual models that synthesize theories and practices from multiple disciplines help gifted students to solve problems that demand complex cognitive and interdisciplinary skills (see Ambrose, chapter 2, this volume). While reading text and listening to teacher presentations, forming visual-spatial images via concept and knowledge mapping enhances students' memory of academic material (Eggen & Kauchak, 2013; Jones, Levin, Levin, & Beitzel, 2000; Sadoski & Paivio, 2001; Sweller, 2008). Also in group brainstorming, picture portfolios are suggested to stimulate creative ideas and discussion (Michalko, 2001). If students have a sharp sense of sound, they can benefit from recording reading text and information, reading out the learning material, and repeating self-talk about the content. They may want to listen to music while studying, and repeat self-talks to remember what they learn from classes. Video clips are useful learning materials for students who are sensitive to both visual and auditory stimuli. In the science laboratory, sensual learners would smell, touch, and/or feel the texture of research materials before conducting experimentation. They are prone to be distracted and unfocused in class because most regular learning activities do not require using multiple senses.

However, sensual learners have the potential to be creative learners, and creative strategies incorporating sensual strengths of these learners are suggested to boost their potential giftedness. For example, physical activities, such as drawing, storytelling, and writing can promote students' memory and learning (Glenberg, Gutierrez, Levin, Japuntich, & Kaschak, 2004; Ormrod, 2014). Observing, imaging, body thinking (e.g., imagination with sensations of movement, tension, and touch), and dimensional thinking are effective thinking and study tools to facilitate creative and critical thinking skills (Root-Bernstein & Root-Bernstein, 1999, 2003; Root-Bernstein, 2015). Creative dramatics consisting of warm-up exercises, movement exercises, sensory and body awareness, pantomime, and other modes of storytelling (e.g., acting out) are other options for enhancing imagination and divergent thinking ability (Davis, Rimm, & Siegle, 2011; Starko, 2005).

Emotional Learner

Emotional learners are emotionally intense, sensitive, subtle, compassionate, and overwhelmed. Similar to those with emotional overexcitability, they are sensitive to the feelings of others, fairness, and justice; are good at empathizing with others' problems (Clark, 2013); and have a strong desire to relate themselves to other people and objects. Students with high emotional sensitivity have great social awareness, responsibility, and leadership skills. They are apt to be aesthetic, artistic, and creative, and show talents in areas, such as writing, music, visual arts, dance,

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etc., that require creative thinking and performance (see Piirto, 1998). Given that there is a growing demand for global leadership today and in the future, emotional learners with advanced interpersonal, collaborative skills, social responsibility, and creative insights have the potential to be future leaders (Ambrose, chapter 2, this volume). Weaknesses however lie in emotional fluctuation – ups and downs – and uncontrollability that has a damaging effect on learning and interpersonal relationships. Particularly for students who are emotionally immature and insecure, academic performances vary by their psychological stability. Emotionally sensitive students are prone to have test anxiety and have difficulty completing tests on time. They may also have poor impulse control and resilience, which leads to repeated academic failures. Due to the uncontrollability of and obsession with their mood, the students become self-centered and closed-minded, and struggle with forming relationships with peers and teachers.

Learning strategies. Emotional students are highly motivated by internal feelings (e.g., enjoyment, enthusiasm, excitement, pride, mastery), and thus, intrinsic reinforcers that make them feel good internally are effective in getting them engaged in learning. Empathizing and play-acting can help them obtain knowledge and skills, and can inspire imagination (Root-Bernstein & Root-Bernstein, 1999). Emotionally sensitive students share some characteristics with creative students, and particularly their high empathetic ability is likely to contribute to artistic inspiration, scientific discovery, and a creative breakthrough (see Root-Bernstein & Root-Bernstein, 1999, 2003; Root-Bernstein, 2015). Creative dramatics, role playing, simulations, and modeling can provide these students with opportunities to explore ideas and understand diverse perspectives by allowing them to become someone or something else in a learning setting (Starko, 2005). In addition, civic-education programs involving academic coursework and hands-on experience are good options for students who are both intellectually and emotionally sensitive (Lee, Olszewski-Kubilius, Donahue, & Weimholt, 2007, 2008; Lee, 2015).

GIFTED LEARNERS BY PARENTAL CONTROL

A large volume of literature has dealt with parents' influences on their children's education. Parents not only maneuver children's education but also have impact on teachers' perceptions about students. For example, some teachers may not feel comfortable and even perceive it as problematic if parents are either too controlling and overly involved in a child's education, or are very indifferent to it. Considering the significant role parents play on their child's education, parental control can be used as one of the practical criteria in understanding the academic needs and characteristics of gifted students. Using the level of parental control, two types of learners are identified: Learners influenced by over-controlling parents versus those influenced by indifferent parents.

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Learners Influenced by Over-Controlling Parents

These students have parents who are deeply engaged with and highly supportive of education and academic work, financially and psychologically. Over-controlling parents organize, monitor, coordinate, and maneuver their children's schoolwork and provide them with various opportunities for educational growth. If parent and child share similar academic interests, the parent can be a propelling force for the child's learning and achievement. Yet too much control from parents has negative impacts. Children are more likely to be passive learners as they move to advanced grade levels. They are vulnerable to academic failures because they grew up merely following their parents' leadership and do not learn how to cope with stress and frustration on their own. They may also have difficulty figuring out what they would like to pursue for future careers and cannot help but choose what their parents expect of them.

Learners Influenced by Parents Who Are Indifferent to Children's Education

This type of learner rarely gains support from parents. Because of parents' indifference to their children's education, the students are likely to depend on themselves and/or other people (e.g., teachers, tutors, peers) to seek help with learning. Positively, they can be self-motivated, self-regulated, and independent learners in order to compensate for the deficit of the parental involvement. However, many of them come from families with low socioeconomic status (SES) in which parents cannot afford to support their education. Mostly, the students are not interested in learning, do not have a strong desire for achievement, and do not talk about teachers, school, and schoolwork at home. What is even worse, some parents are solely interested in grades and academic outcomes despite their indifference to their child's education. Such parental attitude negatively reinforces children's extrinsic academic motivation. Unless the students are intrinsically motivated, autonomous, and self-regulated in learning, they are not likely to gain educational and/or occupational growth without the support and involvement of parents.

Learning strategies for learners influenced by over-controlling and/or indifferent parents. Learning strategies enhancing students' autonomous and self-regulated learning as well as intrinsic academic motivation ought to be considered for both types of students. Learners with over-controlling parents are vulnerable to underachievement, particularly as they advance to higher grade levels, unless they build internal motivation to pursue academic goals. Having choices is critical to every component of self-regulated learning, such as goal setting, self-monitoring, self-assessment (e.g., meeting goals, solving problems, motivation, satisfaction), and use of effective strategies (Eggen & Kauchak, 2013; Schunk, 2008). Teachers and parents can serve as guides for students in setting challenging but realistic

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goals for learning. They can also facilitate students' positive learning behaviors by demonstrating the monitoring and assessment procedure; encouraging self-talk, verbalization, and self-instruction; and modeling to practice learning skills and strategies (Eggen & Kauchak, 2013; Meichenbaum, 2000).

Educational information and services that help students with learning is crucial for students particularly when their parents are not interested in their child's education. In fostering students' learning habits and behaviors, teachers are able to opt for coaching, modeling, and applying steps for self-regulated learning. Continuous monitoring of students' learning progress, periodic counseling with the students to understand their needs, and a peer mentoring and tutoring program are other educational services that motivate students to learn.

GIFTED LEARNERS BY TYPE OF DEVIANCE

Deviant learners are divided into two types, online game addicted learners and school violence (e.g., verbal, behavior) learners. Online game addicted learners have an obsession with the internet and online games, whereas, school violence learners are those who do harm to other students, and spoil classes and overall school atmosphere via verbal abuse and violent action. Deviant learners are not the majority of gifted underachievers, and thus, research involving them is very scarce. Due to advanced technology and the impact of mass communication however, they are more visible than ever in class today and the number of such students is growing fast.

Online Game Addicted Learners

Online game addicted learners are not strangers in today's school setting. Visual-spatial learners, for example, are likely attracted to Internet gaming addiction due to the visual stimuli. There are increasing concerns about Internet game addiction and its negative impact on learning. There might be some benefits of applying computer game addiction to learning, but only if using it appropriately, and cases are rare. For example, students can apply the principle of programming in understanding mathematical and scientific concepts, and mastering problem-solving skills. Online collaborative projects designed for mathematical problem-solving and scientific discoveries may intrigue the addicted learners and stimulate their creative thinking (Nielsen, 2011). They may be interested in the virtual scientific networking that consists of unprecedented, diverse mathematical, scientific, and visual thinkers (Ambrose, chapter 2, this volume).

Undoubtedly, addiction to the internet and/or computer games has negative impact on students' lives. Because the students are apt to suffer from lack of sleep, they get tired easily and cannot concentrate on classes. They are active participants online, yet are reserved, indifferent, and helpless offline, which sparks a conflict with teachers and parents. Vicarious experience with harmful violence has damaging effects on everyday life, reinforcing actual violence and unethical behaviors. Overindulgences

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in the Internet and games may also lead to violent game addiction symptoms for these students.

School Violence Learner

School violence learners (often male students) exert control over friends. Using physical force, they attempt to obtain what they want and often show leadership in peer groups. They are not interested in classes and would spoil the entire class atmosphere with abusive language and aggressive behaviors. Perceived as troublemakers and a threat to other students, they have trouble getting to class and building favorable relationships with teachers. In many cases, the students come from abusive families.

Learning strategies for deviant learners. Self-monitoring, observing, and assessing one's own responses can help students to control behavioral problems in learning. These strategies enable students to become more aware of how frequently they engage in deviant behaviors (e.g., online game addiction, school violence), which is a critical process for behavioral improvement (Bear, Torgerson, & Dubois-Gerchak, 2010; Webber et al., 1993). Teaching students to repeat self-instructions that steer into desired behaviors and providing a coping model to overcome the addictions and school violence are worth considering.

There are some examples of programs developed to modify behavioral problems of addicted students. The reported effects were also positive. One is a behavior modification program designed to identify addiction problems and prevent reoccurrence (see Lee, 2001). The program involves reviewing students' overall life patterns and goal-setting; modifying cognitive and perceptive distortions regarding their Internet game addicted behaviors; looking for alternatives; increasing self-control ability; identifying causes for stresses and stress management; resolving interpersonal conflicts related to the Internet games; and preventing reoccurrence and coping with danger.

Another example of the self-control training program consists of physical activities and play to increase students' self-confidence and positive self-concept (see KADO, 2006). It emphasizes setting a mastery goal, evaluating causes and effects of addiction problems, and reflecting on students' addiction to the Internet and online games. Particularly, the program ameliorates students' impulse control ability. A program that aims to modify addicted behaviors through alternative activities (e.g., self-appraisal, positive thinking about oneself, conversation with family and peers) can be used to reverse students' cognitive and perceptual distortions. It also helps students to adapt to the school setting (KADO, 2003). Also, individual and group counseling programs are suggested to help students understand stresses, motivation, and causes for the Internet addiction, aggressive behaviors, violence, and overall misconduct in school and to plan for appropriate coping skills.

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Other learning strategies for reducing disruptive and aggressive behaviors include a time-out that places a misbehaving student in a separate corner of the classroom or in a separate room (Piffner, Barkley, & Dupaul, 2006; Rortverdt & Miltenberger, 1994; White & Bailey, 1990). For students who are inactive and helpless offline, music, arts, dance, and other forms of artistic and creative activities allow them to express their feelings and emotion, explore their interest areas, and build positive self-images (KADO, 2009).

CONCLUSION

This chapter provides some examples of the many types of gifted learners who are likely dismissed within gifted populations, and thus, may not be served by gifted education today. Although some types of gifted students have more favorable learning characteristics well accepted in classroom and school (e.g., analytical, teacher-centered), most of the types have less or least favorable ones that mask their giftedness and contribute to poor academic performance. In addition, some, such as sensual, emotional, online game addiction, and school violence learners, are not currently the majority of gifted population but will have a greater chance to grow in the upcoming years.

Gifted students are perceived as ideal learners who are capable of self-regulated learning. However, they show a wide array of strengths and weaknesses in learning, and only a few gifted students are prone to achieve at the level commensurate with their giftedness. Twenty-first-century learners are intrigued by and overloaded with a deluge of knowledge and information. It enriches their lives but also makes them distracted and inundated. Moreover, in this fast-moving society, there is greater pressure for early talent identification and speedy talent development for students with potential giftedness. All these personal and societal needs prevent gifted children from growing up to become gifted adults who achieve their potential and benefit the whole society by means of their fulfilled talents.

It is very unlikely to have one single ideal mode of learner in class. Learners are as diverse as the demands of this complex world. As gifted students are heading into unpredictable times with greater changes and risks, it behooves educators to get them ready for the future society. Providing gifted students with efficient educational services catered to their needs not only facilitates their talent development but also enables the gifted to prepare for upcoming challenges and opportunities.

NOTE

- ¹ The interchangeable use of the concepts leads to confusion and criticism, particularly in implementing learning strategies for students based on these styles. For example, learning styles often refer to individuals' preferences in learning which do not necessarily represent ways to think and process information (see Eggen & Kauchak, 2013; Ormrod, 2014).

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15. GIFTEDNESS PLUS TALENT PLUS DISABILITIES

*Twice-Exceptional Persons, the 21st Century, and Lifespan
Development as Viewed through an Affective Lens*

*Things that matter most must never be at the mercy of the things that
matter least.*

Johann Wolfgang von Goethe (1749–1832)

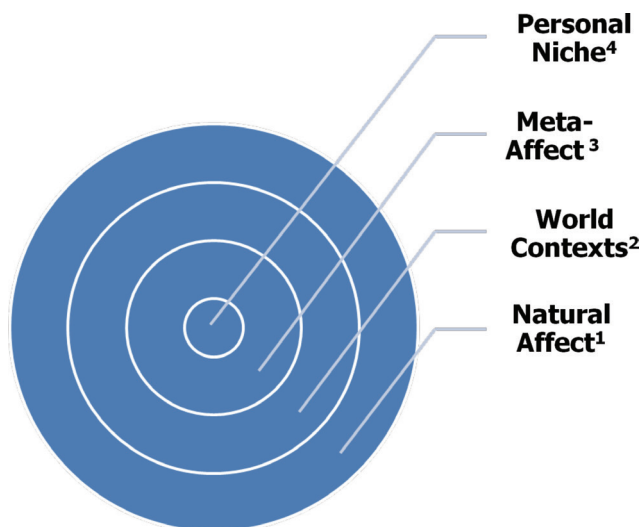
Individuals who must juggle the seemingly incompatible dichotomy of attentional/behavioral disabilities while possessing significant gifts and talents represent a group straddling two subpopulations. Termed “twice exceptional” or “2e,” such individuals have increasingly served as the topic of theory and research alike aimed at children and adolescents (Reis & McCoach, 2000), yet little has been postulated about their development into adulthood (Nauta & Corten, 2002).

The limited existing research on 2e adults has shown that high IQ individuals with attention related disorders often face unique struggles that can preclude them from maximizing their gifts (Baum, Olenchak, & Owen, 1998). For adults who were not identified with ADHD as children, the emotional and intellectual quandary of reconciling unknown attention-related struggles and often resultant maladaptive behaviors becomes a personal source of shame and guilt that can lead to underachievement, anxiety, and depression (Brown, 2005). Particularly as the challenges of the 21st century beckon astute attention to the means for maximizing human potential, the 2e population cannot be easily dismissed nor can overemphasis on this group’s disabilities be allowed to mask their overall strengths.

The application of the Bull’s Eye Model of Affective Development (Olenchak, 2009) (see Figure 1) to twice exceptional adults with ADHD provides a lens for examining the quandary of the 2e population by considering the affective interconnections between four constructs; natural affect (an individual’s natural affective predisposition), world context (influences of the environment), meta-affect (individual affective self-examination) and personal niche (individual matching between capabilities and environment). This model offers a theoretical framework for much needed future research aimed at the symbiotic relationship between cognitive and affective development that maximizes giftedness through the lifespan and improves the identification and management of ADHD symptomology for this population. The critical role affective development plays in the success of 2e adults

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with ADHD is facilitated by providing both a 2e definition specific to ADHD adults, as well as a comprehensive explanation of the Bull's Eye Model.



¹ *Natural Affect* personality, native social proclivity, natural emotional attributes, innate abilities for handling affective information, genetic predispositions, modifiers imposed by giftedness

² *World Contexts* home and family influences, peer pressures, school and work expectations and mores, affective norms of society, views of others about giftedness, “big world” circumstances

³ *Meta-Affect* affective self-examination, social and emotional regulation, impact of giftedness, adjusting natural affect with world contexts for self-adjustment and coping

⁴ *Personal Niche* affective integration (innate with world with meta) to find ways for one’s social and emotional sense to flourish

Figure 1. Bull's eye model for affective development.
From Social-emotional Curriculum with Gifted and Talented Students
(pp. 41–78), by F. R. Olenchak, 2009, Waco, TX: Prufrock Press.
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In this chapter, twice exceptionality or 2e is defined as persons “... who have or show potential for remarkable gifts and talents in specific areas, but whose deficits and difficulties in learning, paying attention, or meeting social and emotional expectations impede their development” (Baum, Rizza, & Renzulli, 2006, p. 138). Although extensive research has been conducted on the topic of gifted individuals as well as on those with ADHD, there are very few studies that examine gifted adults with ADHD. Current research reveals only three studies that specifically examined giftedness (defined by high IQ) and ADHD in adults (Antshel, Faraone, Maglione,

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Doyle, Fried, Seidman, & Biederman, 2009; Antshel, Faraone, Maglione, Doyle, Fried, Seidman, & Biederman, 2010; Brown, Reichel, & Quilan, 2009) and only three studies that examined twice exceptional college students with ADHD (Frazier, Youngstrom, Glutting, & Watkins, 2007; Hua, Shore, & Makarova, 2014; Trammell, 2003). To make strides for the 21st century, it is critical to consider talent development of twice exceptional persons through the lifespan. Further, there is a need for future research to examine the gaps and impairments in cognitive and affective domains, as well as to advance diagnostic and treatment procedures that delineate attributes associated with ADHD and/or giftedness in order to facilitate talent development.

To establish a foundation for such an ambitious research agenda and to facilitate understanding of lifespan talent development among the 2e population, a look at the adult 2e subgroup is logical. Given extant evidence underscoring the necessity of cognitive-affective consonance for optimizing talent among all people (Lyubomirsky, King, & Diener, 2005), framing consideration of 2e adult development through a predominately affective lens provides opportunity to focus on the overlooked psychosocial variables that ultimately undergird performance.

THE BULL'S EYE MODEL OF AFFECTIVE DEVELOPMENT

Although it is clear from the literature relating to personal security and adjustment that humans continually engage in a quest for affective integration to find ways to flourish (Barab & Plucker, 2002; Beltman & Volet, 2007; Hodges & Clifton, 2004; Seligman, Rashid, & Parks, 2006; Sin & Lyubomirsky, 2009), there are no guarantees—even if some level of wellbeing is attained—that development of one's talent will also be achieved. However, there is little doubt that talent development, as a subset of determining one's place in the world, is critical (Barab & Plucker, 2002), and reliant on the success of the journey for affective integration.

To consider talent development in this regard, three segments of extant literature demand attention: (1) theories and research that link cognition with affect (e.g., Flavell, Flavell, & Green, 2001; Immordino-Yang & Damasio, 2007; Kumpfer, 2002; Pessoa, 2008; Phillips, von der Malsberg, & Singer, 2010); (2) research investigations of positive psychology (e.g., Lopez, Pedrotti, & Snyder, 2015; Seligman, 2004; Seligman, Steen, Park, & Peterson, 2005; Snyder & Lopez, 2009); and (3) positive psychology with respect to giftedness and talent development (e.g., Barab & Plucker, 2002; Larson, 2000; McClarty, 2015; Subotnik, Olszewski-Kubilius, & Worrell, 2011). Each of these groups of inquiry posits important information for understanding the critical role of affective development for happiness and that maximize the affective-cognitive relationship that indeed enables successful pursuit of happiness. One's talents and abilities must be addressed and afforded opportunities for optimization if overall contentment is to develop. Positive experiences in handling stress associated with negative events are also requisite for elevating talent and determining overall contentment (Folkman & Moskowitz, 2000).

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Relying on these various foundational aspects of research and theoretical literature, the Bull's Eye Model for Affective Development (again refer to Figure 1) offers a means for grasping the diversity of constructs embedded in positive psychology, giftedness, and talent development in a manner that facilitates consideration of the ways 2e individuals may be better accommodated. The Model, composed of four fluid stages of development in which each stage serves to influence the next, reflects the codependence of affective and cognitive variables in terms of achieving contentment. The four stages (Natural Affect, World Contexts, Meta-Affect, and Personal Niche) are briefly discussed below.

Natural Affect

The age-old nature versus nurture controversy has largely been laid to rest thanks to advances in neurobiological sciences (Garcia-Coll, Bearer, & Lerner, 2004). Consequently, nature and nurture each hold a role that is critical in the overall formation of each individual's abilities, how those talents are directed, and in what ways they are applied.

The natural "wiring" one possesses has an inexorably crucial influence on one's emotionality. The ways in which an individual responds to environmental stimuli, processes and generalizes those responses to engender feelings, expresses those feelings, and then saves them as referents for future use are shaped by one's personality. Natural Affect encompasses the affective dimensions of individual personality, the inherent social inclinations, the natural emotional qualities, and one's innate abilities for processing and applying affective information, temperament, and genetic predispositions.

The mediating effects that giftedness imposes on personality and the manner in which individual personality impacts life processes and outcomes are not well documented, yet there is adequate evidence to believe that giftedness does play some role in personality and vice-versa (Friedman-Nimz & Skyba, 2009). Similarly, there is an empirical foundation supportive of the notion that one's personality and the presence of ADHD are also interrelated (Nigg, John, Blaskey, Huang-Pollock, Willcutt, Hinshaw, & Pennington, 2002). Unfortunately, the line of inquiry probing the relationships among personality, disabilities – personality and 2e, is limited, but again, there is reason to believe that nature is an important mediator regardless of the exceptionality (giftedness and/or disability).

Moon, Zentall, Grskovic, Hall, and Stormont (2001) used multiple case study methodology to compare three boys with ADHD and giftedness with six boys who had either giftedness or ADHD but not both exceptionalities to investigate an array of personality and psychosocial variables. The researchers concluded that giftedness (perceived as a positive exceptionality) and ADHD (perceived as an exceptionality with negative implications) were equal in terms of their interactions with personality. Neither did giftedness serve as a protector for ADHD, nor did ADHD serve to inhibit the giftedness. Rather, the natural proclivities of

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personality appeared to serve as the rudder for the ways in which giftedness and ADHD interrelated for self-regulation of behaviors, for social interaction performances, and for handling situations.

Bierhoff, Klein, and Kramp (1991) had explored the construct of an altruistic personality type among persons who had aided traffic accident victims. The researchers concluded that feelings toward empathy appear to be innate, and it was these inherent personality components of natural compassion that caused them to become involved with the accident victims. As a result, it seems plausible that some aspects of affect are integrated into individual personality from birth.

Representative of a large body of literature that has probed human affect, these studies and others provide more than ample reason to believe that each individual is born with “original factory equipment” that enables the construction of affective and cognitive identities. There exists an enormous literature base to understanding individuals’ cognitive abilities and certainly schooling and special educational services for children and adolescents have been predicated on this research foundation. In contrast the theoretical and empirical foundation for grasping the affective domain is not as extensive. Nonetheless, that research base does support the notion that cognitive and affective variables can be perceived and treated similarly. If one’s cognitive abilities are the groundwork for one’s thinking abilities, then affective abilities provide the footings for each individual’s feeling abilities.

World Contexts

Regardless of whatever nature provides us from the onset in terms of personality and temperament, life context serves to shape Natural Affect. Common sense dictates that human interaction with the environment, both social and physical, impacts individual development. The presence or absence of intellectual stimulation, social connectedness, and critical resources impacts how an individual is able to navigate daily life. Situational factors such as family values, peer pressures, and collective expectations dictated by the formalized societal structures of school and work continuously interact, creating a dynamic melting pot of experiences that fuels affective development.

The domination of standardized testing in educational settings in recent decades demonstrates how situational variables shape World Context, and they can impact both cognitive and affective development, particularly for students who differ from the mythical “typical person” in any way, such as those of color, from poverty, and with twice exceptionalities. The recent works of Ambrose (2013) and Wilkinson and Pickett (2009) lend support to contextual factors impacting giftedness, specifically through a social inequality lens. Additionally, a critical flaw of the standardized testing movement is that policymakers have failed to acknowledge the role that historical systems of racism and oppression have played in the depressed scores that students of color often receive on standardized tests. Minority students can experience what Steele and Aronson (1995) have termed *stereotype threat*. This

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concept asserts that when individuals are faced with a scenario that can confirm a negative stereotype, subsequent student performance suffers. Students who have to combat the anxiety that accompanies stereotype threat often shy away from challenging themselves academically, and such circumstances can cast a pathway for a lifelong, self-fulfilling prophecy of underachievement or failure (Smith, Hung, & Franklin, 2011). When people are made aware of any negative stereotype (race, religion, socioeconomic status, giftedness, disabilities etc.) that could apply to them, they exert cognitive energy to ensure that the traits associated with that stereotype are suppressed (Schmader, 2010). Unfortunately, the executive processing functions being utilized to suppress stereotypical traits are the very functions needed to complete higher-level cognitive tasks. The ongoing navigation of a social landscape that devalues specific groups places a cumulative affective burden on gifted students who differ from the norm that shapes their social behavior and individual identity development.

Although there has been a great deal of inquiry about the effects of environment on intellectual development (e.g., Sternberg & Grigorenko, 1997; Dweck, 2006; Gladwell, 2008), literature of similar quality about the effects of environment on affective development tends to focus on psychological disturbance. Steinberg and Avenevoli (2000), in a thorough examination of the research bases regarding the contexts of behavioral problems, concluded that negative environmental situations yield behaviorally negative outcomes and that affective development is shaped by environmental dynamics including location, home life, and timing. In addition, recent brain development research indicates that brain maturation continues throughout adolescence, particularly in the areas of the brain that manage behavior, emotion, and the ability to assess risks and rewards (Steinberg, 2005).

Meta-Affect

As people mature psychosocially, they tend to reflect more often upon how they feel about their own feelings and then use this assessment to refine their repertoire of affective skills. They are actively thinking about their feelings. Meta-affect, as it is called within the Bull's Eye Model, is inclusive of the complex process that is taking place as individuals examine their feelings, and then use those self-inquiries to regulate and refine emotions. A 2e individual's ability to navigate the complex interpersonal, socioeconomic, cultural, and political dimensions of a dynamic 21st-century environment requires specific knowledge and skills that can assist them in defining who they are naturally, how their small and large worlds impact their life circumstances, and the value and means for integrating thoughts and feelings in the meta-affective context. Although the *analytic* feel indicates that this introspective assessment is conducted cognitively, it actually occurs *affectively*; individuals purposefully make an effort to probe their feelings about their affective traits by relying on their emotions to do so.

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DeBellis and Goldin (1997, 2006) identified Meta-Affect as an important variable when considering the nature of students' affective domain as they are involved with mathematics curriculum and instruction. Meta-Affect has been explained by one of its originators as:

An idea that has assumed a central role in our thinking is *meta-affect*, referring to: (1) affect about affect; (2) affect about and within cognition that may again be about affect; and/or (3) monitoring of affect both through cognition and affect. Our hypothesis is that meta-affect is *the most important aspect of affect*. (Goldin, 2004, p. 13)

Goldin indicates clearly that the cognitive domain is involved when feelings are being assessed. Rather than the ordinary approach of thinking first and feeling second, being in a state of Meta-Affect involves allowing the feelings to function first and thinking to function next.

Meta-Affect can be examined through a Swiss psychiatrist's work on the complexities of meta-affective behaviors. Ciompi (1982, 1988, 1991, 1999, 2003) explored the linkages between cognition and affect, which he called *affect logic*, in clinical studies of patients with schizophrenia. He concluded that feeling and thinking are related, although they are different, and must be considered as a single unit regardless of the activity in which one is engaged. Cognition cannot and will not take place effectively if affect is not a part of it; correspondingly, affect cannot and will not function well if cognition is disregarded. Ciompi also concluded that the confluence of one's assimilations and accommodations with reality propels the development and maturation of one's psyche over time. His assumptions were further supported by other psychiatric findings regarding the role of the limbic and hypothalamic systems for emotional regulation, neuronal plasticity, and the phenomenon of state-dependent learning and memory (Ciompi, 1991). Essentially, cognition and affect are segments of a unitary psyche that allows for complex feeling, thinking, and behaving.

Given Ciompi's momentous research, think of how a typical individual might interact with an environment that does not offer sufficient stimulation, cognitively or affectively. This individual may describe a situation where affect is ignored and focuses solely on cognition as "taxing" or "difficult," while a setting that attends to affect and neglects cognition may be labeled as "fluffy" or "soft." Now contemplate a 2e gifted individual who, by definition is capable of quicker and deeper thinking and feelings, is confronted by a classroom that fails to account for cognitive and affective development. Suddenly, under-stimulating academic settings, as they are frequently categorized in gifted research literature, may just as easily be categorized as under-stimulating affective settings.

Developing schematic emotions appears to be incumbent on the meta-affective process, thus, exposure to a wide variety of experiences that elicit a broad range of feelings is necessary to promote full development of an individual (Barron,

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2006; Beltman & Violet, 2007). Simultaneously, exposure to various and numerous academic stimuli is requisite to this development. In other words, learning to manipulate and apply academic subject matter is no more or less important than learning to manipulate and apply affective schema (Wimmer & Ciompi, 1996).

Personal Niche

According to existential theory, the ultimate, optimal goal in life is to establish a sense of belonging, yet to also have the freedom to exercise independence (Schneider, 2011). This balance requires both cognition and affect, and in the Bull's Eye Model, integration of affect and cognition increases as one moves from Natural Affect to World Contexts and Meta-Affect to Personal Niche. Moreover, it is logical that the greatest likelihood for fluidity among stages occurs across World Contexts, Meta-Affect, and Personal Niche as one grapples with messages delivered by one's era and location (i.e., World Contexts within the 21st century), enhancement of one's emotions by acquiring more sophisticated schema (i.e., Meta-Affect), and concludes to a place of affective and cognitive serenity and adjustment (i.e., Personal Niche). Yet, each of these developmental stages remains highly reliant on one's original affective state as contained in Natural Affect.

The term Personal Niche, is a familiar concept for researchers and theorists in the psychology/psychiatry field. The first known discussion on Personal Niche involved the perceived "fit" in psychotherapy between an individual's skills/capabilities and his/her environment (Willi, Toygar-Zurmühle, & Frei, 1999; Willi, 1999). The research on this topic asserts that mentally healthy individuals will continually engage in a campaign to promote mental health and well-being through changing, yet controlling, the influences on one's life (e.g., other people, environments, and stimuli). In this explanation, emotions are just as important as thoughts; cognition and affect must be engaged simultaneously and cohesively to erect a safe "nest" in which one feels at peace (Sternberg, 1985).

Past research has proven that as lifespan development continues, healthy individuals have the capability to integrate the many aspects of their lives in order to form a state in which they feel secure in their affect and cognitions (see Bailey, 2011 for a discussion on Dabrowski's Theory of Positive Disintegration). However, given the vagaries of life embodied in World Contexts as well as in Meta-Affect, it seems appropriate to view this place – this Personal Niche – as ephemeral, one that must repeatedly be examined using both Meta-Affect and World Contexts, with one's individual affect and predispositions in Natural Affect as a background filter. The Personal Niche stage may be attained again only after one's collection of emotions has been modified according to inputs derived from World Contexts and Meta-Affect (Bailey, 2011).

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AN EVOLVING NATURAL AFFECT: DIAGNOSIS AS AN ADULT

Although previous research indicates that ADHD symptoms decrease with age, a comprehensive review of all of the diagnostic measures to assess this disorder concluded that such measures were designed for use with children (Brassett-Harknett & Butler, 2007). Impulsivity, restlessness, and inattention often persist into adulthood, and research studies vary in the estimations of adults who continue to experience symptoms, ranging between 4–60% of the ADHD population, while longitudinal data evaluating the validity of adult ADHD scales have proved to be insufficient due to problems in first identifying and then following research participants (Brassett-Harknett & Butler, 2007). Barkley, Fischer, Smallish, and Fletcher (2002) relate that by relying mostly on self-report measures, previous studies may be underestimating the levels of persistence among the adult ADHD population.

Assessment of executive functioning through neuropsychological testing is not an adequate measure when attempting to determine levels of impairment. Brown (2005) indicated that the majority of tests that examine executive functioning target one area at a time (e.g., memory, reasoning, task flexibility, planning, and problem solving). Isolating single variables does not measure an individual's ability to manage a variety of processes at the same time, which by definition is the very essence of executive functioning (Rose & Abi-Rached, 2013). Several studies provide corroborating evidence underscoring the need for improved instrumentation and procedures for diagnoses among individuals presenting characteristics associated with 2e.

Boonstra, Oosterlaan, Sergeant, & Buitelaar (2005) compared thirteen studies to assess the degree to which executive functioning serves as the main explanatory neuropsychological domain for ADHD. This analysis supports prior research in the identification of medium effect sizes found in the executive functioning areas of verbal fluency ($d = 0.62$), inhibition ($d = 0.64$), and set shifting ($d = 0.65$). However, results also indicated medium effect sizes in the non-executive functioning areas of consistency of response ($d = 0.57$), word reading ($d = 0.60$), and color naming ($d = 0.62$). These results indicate the need for further examination of established models for conceptualizing ADHD that rely extensively on executive functioning for explanatory power.

Another way to study the symptoms of ADHD in the 2e population is through emotional impulsivity (EI). EI was assessed in adults identified as hyperactive ($n = 135$) during childhood, 55 of which were identified with ADHD at the time of follow up (Barkley & Fischer, 2010). EI significantly correlated with ADHD symptom self-report, including inattention ($r = 0.46$, $p < 0.001$) and hyperactivity-impulsivity ($r = 0.62$, $p < 0.001$). Differences among the groups for EI symptoms were significant for all seven symptoms (i.e., impatient, quick to anger, easily frustrated, over-react emotionally, easily excited, lose temper and easily annoyed).

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EI produced variance beyond the ADHD symptoms in reference to deficiencies expressed by participants in the areas of home functioning, social interactions, intimate relationships, money management, driving, and recreation. Similarly, cognitive functioning also was influenced by ADHD (e.g., planning, initiating and completing tasks, adapting to change, and providing socially appropriate responses), and these aforementioned deficits affected both psychosocial and functional domains. The impact on functional domains accounted for lower quality of life in the areas of work, relationships, substance abuse, unemployment, and criminal behavior. Finally, the study concluded that functional impacts were more predictive of low quality of life than were the ADHD symptoms and the resulting impairments (Barkley & Fischer, 2010).

Complicating quality of life issues, the under-diagnosis and misdiagnosis of ADHD in the twice exceptional adult population contributes to affective dissonance, often leaving individuals to accept personal blame for their struggles. A 2009 study conducted by Antshel and colleagues examined a high-IQ ADHD group ($n = 64$, average age 33.4) and a high-IQ control group ($n = 53$, average age 27.9). Participants were required to present IQ scores at or above 120 to qualify for the study. The results indicated that major depressive disorder, obsessive-compulsive disorder, and generalized anxiety disorder diagnoses were more frequent in high-IQ adults with ADHD in comparison to the high-IQ control group. Overall, the psychological issues experienced by the high-IQ ADHD sample mirrors the same level of psychiatric co-morbidity and functional impairments that have been previously identified by the average-IQ ADHD population (Arnold, Eastal, Rice, & Eastal, 2010). These findings indicate that ADHD may be a valid diagnosis among high-IQ adults and nurtures the hypothesis that comprehensive assessment examining functional impairments, clinical correlates, and family history for this population may provide the kind of evidence useful for both identification and intervention.

The interaction among Natural Affect, high intellect, and ADHD, particularly for an adult who has lived without a diagnosis for most of his/her life, often leads to frustrating maladaptive behavior that is difficult to understand or change. Once a diagnosis has been made, twice exceptional adults are faced with the charge of identifying the manner and degree to which the disorder is causing impairments. These impairments can be magnified or diminished depending upon the Natural Affect of the individual, but regardless, internalized perceptions of disharmony. This begs the questions: How does a gifted individual's affective "wiring" mediate or moderate his/her ADHD symptomology? Are ADHD symptoms compounded by negative affective emotional states? An important component in identifying successful coping strategies is to determine exactly which cognitive and behavioral functions are impaired by the disorder, thus allowing individuals to understand how their emotional state influences their ability to deal with the impairment.

Illustrative of this interaction between Natural Affect and ADHD is a study conducted by Fried et al. (2012) encompassing 56 non-medicated young adult participants with ADHD and 63 matched control participants without ADHD. All

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participants worked for 10 hours in a workplace simulation laboratory where tasks required extensive vigilance, planning, cooperation, and attention to detail. During this time, they were observed and rated by researchers, and the participants also submitted their responses to self-report questionnaires. Task performance in math fluency ($F = 4.63, p < 0.004$) and editing text for spelling ($F = 2.84, p < 0.041$), punctuation ($F = 3.2, p < 0.027$) and grammar ($F = 5.6, p < 0.005$) proved to be the areas of most significant statistical difference between the two groups, with the group of participants who had ADHD performing more poorly than the control group. Self-ratings of ADHD symptoms throughout the day were significantly elevated for participants with ADHD as compared to the control group on all time periods and tasks. Comparison between the self-reports and observer ratings showed that ADHD participants were able to hide their symptoms from research observers, but they self-reported experiencing significant levels of “inner turmoil” (e.g., internal restlessness, boredom, difficulty maintaining vigilance) that impacted their ability to complete tasks on the job successfully. These findings illustrate how many ADHD adults expend affective energy masking their symptomology and, in turn, increase their level of anxiety by working to hide ADHD behaviors.

ADHD is largely seen as a “kids’ disease” by the general populace, and admitting to supervisors or peers that one experiences cognitive and emotional barriers may elicit one to become victim to unwanted vulnerability and judgment. In the adult workplace, appearing less than independent, less than self-assured, and less than intact cognitively and affectively can set one up for ridicule if not outright job failure (Hudson & Rapee, 2000).

There exists evidence that, in spite of advancing age, 2e adults continue to experience impairments that are reflective of ADHD diagnoses. Brown, Reichel, and Quinlan (2009) conducted a study of 157 adults with ADHD and IQs above 120. Results indicated that 73% of the subjects were significantly impaired on more than five assessments measuring executive functioning, significantly higher in comparison to the general population. This study suggests that gifted individuals with ADHD experience symptoms of ADHD at the same levels as non-gifted individuals with ADHD, but it did not measure the prevalence of comorbidity with other disorders in this population.

In a study one year later, Antshel and colleagues (2010) found that, in comparison to a high-IQ control group, high-IQ subjects with ADHD showed impairments in both inhibition and the organizational components of memory. Although differences were observed in regards to these executive functioning dimensions, high-IQ adults with ADHD displayed an average mean performance on these specific measures.

Taken together, all of these results illustrate the dilemma encountered by intellectually gifted adults with ADHD. While average performance on executive functioning measures negates the need for Americans with Disabilities Act (ADA) accommodations for the high-IQ population, newly adopted amendments to the ADA may allow high-IQ individuals to be measured against their intellectually gifted peers (Heekin, 2010). This change would have a significant impact on how

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accommodations are determined in both educational and occupational settings for the high-IQ ADHD adult.

WORLD CONTEXT: HOW IN THE “WORLD” DO WE MISS THEM?

External factors derived from an individual’s World Context (time, place, conditions) influence the development of the affective self (Olenchak, 2009). In unraveling how an individual’s World Context can lead a twice exceptional adult to travel through childhood undiagnosed, it is essential to examine the systems that evaluate and diagnose both giftedness and ADHD. Many school districts rely almost explicitly on normative assessments, analyzing standardized test scores and classroom performance in relation to a student’s grade level (Gilman et al., 2013). Identification of a twice exceptional student is more easily facilitated by a comprehensive assessment where a trained clinician can interpret the differences in a student’s abilities and performance levels, pinpointing where weaknesses stunt the development of giftedness.

The World Context of Law

As school districts interpret the current parameters set forth by the Individuals with Disabilities Education Improvement Act of 2004 (IDEA, 2004), comprehensive assessment is often restricted by the Response to Intervention (RTI) process (Gilman et al., 2013). This process requires that a student be observed by a classroom teacher and be provided tiered interventions to address performance issues. Only when a student is engaged in the RTI process and then still performs below grade level is a referral for special education assessment allowed. Silverman (2003) related that gifted students with learning disabilities often test and subsequently perform at average or above average levels, as their elevated cognitive abilities provide a compensatory mask for their disability.

Gifted students with disabilities deal with challenges, but they must also wrestle with the added element of frustration that arises when their gifts are truncated by weaknesses related to their diagnosis (Baum, Olenchak, & Owen, 1998; Sternberg & Grigorenko, 2004). Knowing that they are gifted but cannot execute due to their disability results in the development of low self-esteem, particularly for a student in a developmental stage where an emotional understanding of this phenomenon is limited (Silverman, 2003). When individuals must mediate two seemingly bifurcated exceptionalities such as giftedness and disabilities, the likelihood is profoundly increased for exacerbated asynchronous development, a feature of giftedness that presents a challenge for even those gifted individuals without disabilities (Olenchak, 1994; Olenchak & Reis, 2002; Silverman, 2003).

Twice exceptional students may find themselves categorized into one of three groups that evolve as a result of an individual student’s circumstances (King, 2005). The first group of students is identified as gifted who also have subtle learning

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disabilities. These students achieve on grade level, and their learning disabilities are often overlooked. Consequently, this dynamic prevents these students from understanding how their learning disability impacts their academics.

The second group is comprised of those students who are not identified as gifted or learning disabled. In these cases, a student's high abilities mask the learning disability, and the learning disability masks the giftedness. Students in this category rarely raise any red flags, but they function far below their potential. Talent in specific areas may present later in life, but these students may suffer from mild depression, as they are unable to pinpoint the source of their underachievement.

Finally, the last category consists of students who are identified as both gifted and learning disabled due to their tendency to stand out in a class (King, 2005). These students are highly intelligent, but they often fail academically and are noticed much more frequently for their learning disability than for their talents. Given that less attention is paid to their talents, they tend to become focused on failure. These factors lead to disruptive behavior, low self-concept, and low self-esteem (Baum, 1994). When compared to students who have a learning disability alone, 2e students have the added challenge of coping with both a more active internal critic and the creation of high goals. Such individuals may have a strong belief in their abilities and, as a result, develop expectations that are not realistic due to the learning disability. Those high expectations may inevitably lead to more instances of failure, leading to a fear of failure and increased anxiety in relation to academic tasks. These underlying feelings manifest in the form of impulsive and aggressive behavior. With the discrepancies between giftedness and disabilities affecting both the global and academic self-concepts, many 2e students have lower self-concepts than those held by their non-2e, achieving peers (King, 2005).

The U.S. Department of Education has provided clarification indicating that the RTI process cannot serve as a barrier to parental requests for comprehensive assessment. Colorado describes their comprehensive assessment process as "more focused on the specific areas of a suspected disability than in the past – when a comprehensive evaluation typically meant a common and extensive battery of assessments given to all students referred ..." (Colorado Department of Education, Exceptional Student Services Unit, 2012, p. 1). This model of assessment increases the likelihood that twice exceptionality will not be properly identified, thus denying gifted students the accommodations and support that could make significant differences in achievement and social emotional development.

The World Context of Educational Practice

As regulations are interpreted and applied in many K-12 systems, parents find themselves restricted from access to services that identify and support 2e students (particularly for those parents that do not have the means for private testing and treatment). In an era of budget cuts and economic recession, school districts are motivated to limit the number of students who receive special education services

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in order to decrease spending. Unfortunately, this type of educational neglect can prevent the pursuit of higher education for 2e students due to the denial of accommodations on college entrance tests (Gilman et al., 2013). As these processes are put into the hands of classroom teachers that are not trained in proper diagnosis, 2e students experiencing underachievement will increase, robbing society of significant contributions. Most importantly, 2e students are left without a functional lens with which to view their unique cognitive and affective attributes.

Absence of supports has been shown to impact educational experiences, but also can significantly affect an individuals' career trajectory and relational abilities as an adult. Hindered from realizing their full potential, the undiagnosed 2e adult often struggles with maladaptive behavior and comorbid diagnosis. The absence of research in relation to maladaptive behavior among twice exceptional adults with ADHD necessitates looking at studies that examine the general ADHD population. Young adults (mean age = 20–21 years), both ADHD ($n = 147$) and community control ($n = 73$), engaged in a follow up assessment of antisocial activities and illegal drug use (Barkley, Fischer, Smallish, & Fletcher, 2004). Statistically significant differences ($p < 0.001$) were found in antisocial behavior between the two groups for stolen property ($\chi^2 = 12.19$, $\eta^2 = .235$), carrying a concealed weapon ($\chi^2 = 17.41$, $\eta^2 = .281$), and being arrested more than two times ($\chi^2 = 16.95$, $\eta^2 = .278$). Differences in illegal drug use were statistically significant ($p < .001$) for marijuana, hallucinogens, and frequency of use within the previous three months.

Popular conceptions indicate that ADHD is a disorder that presents in childhood and that it may not be a valid diagnosis for adults (Bhattacharya, 2011). As a result, many twice exceptional students may remove the disorder from consideration in trying to understand the challenges they experience as they transition into adulthood. A World Context that supports inaccurate “self-diagnosis” contributes to continued confusion and perceived character flaws as ADHD symptoms rear their ugly head.

The World Context of Transition to Adulthood

While working at a clinic for attention related disorders at Yale University, Brown (2005) studied 103 adults with high-IQ scores seeking treatment for ADHD related problems. Brown discovered that 42% of those studied had dropped out of post-secondary education at least once. The prevailing trend for these individuals was that they did extremely well in the subject areas in which they had intense personal interest or where the instructor was engaging.

With just a few exceptions they did not leave because of substance abuse; they failed out because they were unable to make themselves go to classes regularly, take decent notes, complete the assigned readings, study adequately for tests, and finish enough written assignments on time. Most reported that they realized at the time what needed to be done, and tried to push themselves

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to do it, but just did not have enough ‘willpower’ to make it happen. (Brown, 2005, p. 145)

Brown indicates that many of these students suffered from omni-potentiality, a fantasy-based mentality where an individual believes all things are possible (2005). This position prevents individuals from fully committing to an occupational choice.

A 19–25 year old sample of hyperactive ($n = 149$) and community control ($n = 72$) subjects participated in a 13-year follow up assessment (Barkley, Fischer, Smallish, & Fletcher, 2006). Results demonstrated significant differences at the $p < 0.001$ level for educational attainment (graduated high school; $\chi^2 = 31.12$, college enrollment; $\chi^2 = 65.89$) and involuntary termination from employment ($\chi^2 = 19.97$). Biederman, Faraone, Spencer, Mick, Monuteaux, and Aleardi (2006) found significant impairments in the functioning of 500 adults with ADHD compared to a matched group of 501 adults without the disorder. This study found that adults with ADHD were less likely to have graduated from high school (83% vs. 93%, $p < .001$), have graduated from college (19% vs. 26%, $p < .01$), and be currently employed (52% vs. 72%, $p < .001$) (Biederman et al., 2006). Additionally, the adults with ADHD changed jobs more often than the adults without ADHD did over a 10 year period ($M = 5.4$ vs. $M = 3.4$, $p < .001$), and were more likely to be arrested (37% vs. 18%, $p < .001$).

Family influences, peer pressures, school, and work expectations and the affective norms of society create a World Context that greatly influences an individual’s behavior. The way that others view giftedness and exceptionalities like ADHD, impacts behavioral choices, affective development and identity of the 2e adult. Steinberg and Avenevoli (2000) examined the research of contextualized behavioral problems and concluded that negative environmental situations lead to behaviorally negative outcomes, and that affective development is shaped by environmental dynamics within the contexts of location, home life and timing. 2e adults that have not been properly diagnosed tend to inaccurately contextualize their struggles and then create affective schemas centered on self-blame, incompetence and failure.

META-AFFECT: FROM PERSONAL SHAMING TO EMPOWERED REFRAMING

Giftedness provides twice exceptional adults with the capacity to process thoughts and feelings in a shorter time span and with a greater degree of depth (Ciompi, 1999). For the undiagnosed adult, this capacity can be detrimental if affective schemas are built on faulty reasoning and negative emotions. The meta-affective process can function to reinforce these misconceptions as feelings are used to assess emotional states (Olenchak, 2009). Individuals define schemas based on emotions that arise via life experiences. Over time, these schemas may be revisited and adjusted based upon a person’s individual experiences and motivation or affective ability to reframe such experiences through different emotional lenses. In essence, life experiences create situations where emotions are employed, but it also provides the opportunity

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for differentially defining one's emotions via affective and cognitive reflection. For gifted individuals, the need for exposure to a wide range of affective experiences is just as important as ongoing cognitive challenges to optimize development of individual talent (Olenchak, 2009).

Waite and Tran (2010) examined the interaction between Meta-Affect and behavior in a study of a diverse cohort of 27 participants (ages 18–25) from four academic institutions. Participants engaged in a qualitative descriptive study that examined how post-secondary students with an ADHD diagnosis conceptualized their condition and how this framework impacted their help-seeking efforts (2010). Participants who were diagnosed with ADHD as children indicated that some parents denied the validity of ADHD as a “real disorder,” or believed the diagnosis was a means for medical entities and pharmaceutical companies to generate profits.

In communicating their personal explanatory model, study participants identified with the neurobiological factors that contribute to ADHD, most likely as a result of being exposed to information at school on the Internet (Waite & Tran, 2010). Half of the participants were not diagnosed until young adulthood, and instances of a comorbid diagnosis varied by gender with a 5:1 (women to men) ratio. Participants reported inconsistent use of medication to treat their disorder, indicating that taking medication caused them to develop a fear of addiction and left them feeling less like their authentic selves. The majority of participants had not sought support services through the student disabilities office, indicating that they were not aware of services related to ADHD or were reluctant to use services as a crutch. These participants also related that they did not view ADHD as a disability and that they wanted to avoid the stigma of ADHD being associated with mental illness (2010). These responses illustrate the detrimental conclusions that can be derived from Meta-Affect amidst an unsupportive World Context.

In contrast, Fleischmann and Miller (2013) demonstrated how Meta-Affect can serve to empower adults with ADHD. In a study that examined 40 individual life stories of adults who were diagnosed with ADHD, data were obtained from fifteen Internet sites that provided access to personal narratives. Criteria for study selection included stories where the narrator was formally diagnosed after adolescence, stories where the primary diagnosis was ADHD, and stories written in the first person in which the main problem expressed was ADHD. Two themes were common among the narratives examined for this study. The first theme was the role of confusion in the lives of adults who were not diagnosed with ADHD until after adolescence (2013). Of the fifteen sites, fourteen indicated that individuals had difficulty concentrating, organizational and social challenges, and issues with task completion. The second theme included reframing previous struggles and release of shame and guilt.

The descriptors used in the narratives tended to refer to the medical model, indicating that, upon diagnosis, participants were inclined to take on a pathological view of their issues (2013). Many of them believed that the struggles they experienced were a reflection of their personality, leading to feelings of guilt, low self-esteem, and difficulty accessing and applying their talents and gifts. After receiving a

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diagnosis, the narratives indicated that subjects were able to contextualize their past and release the feelings of shame that had colored their adult lives. Many of the narrators began to view their condition through Antonovsky's (1996) salutogenic model of supportive health promotion, viewing ADHD as a difference as opposed to a disorder. This model of coping employs the use of generalized resistance resources that allow subjects to evolve into more coherent individuals who could manage their difficulties and identify the advantages of ADHD.

The evaluation of these narratives led Fleischmann and Miller (2013) to present a four-stage model of development for adults with ADHD who were not diagnosed in childhood. First, adults undiagnosed as children with ADHD experience and deal with difficulties for which they cannot identify the source, thus attributing failures to their personal character. Second, guilt increases and impairs the individual's ability to cope with negative life outcomes. Third, an ADHD diagnosis allows adults to construct an alternate life narrative where they are not fundamentally flawed, but instead are individuals with specific impairments that were not addressed. Fourth, adults who have adopted the new narrative and are able to let go of the long carried guilt, seek treatment to manage symptoms effectively (e.g., medication, therapy, family support.) and begin to embrace their talents and experience success.

As a result of these exploratory studies, Meta-Affect for 2e individuals can be construed as a critical stage in which each one not only weds cognition and affect to investigate his/her personal life situation, but it also provides a self-robing opportunity for responding to the needs identified in that process. The meta-affective stage is truly one in which people from all walks of life must engage with some degree of frequency if they are to approach, locate, and sustain positions of self-adjustment. For the 2e individual this stage fosters an imperative reframing of self and life situations so that talents are emphasized and weaknesses de-accentuated.

PERSONAL NICHE: COPING STRATEGIES AND CULTIVATING CREATIVITY

Here, feelings are every bit as critical as thoughts: cognition and affect must work as coequals in a mechanism for streamlining what amounts to a never-ending task for each individual to erect a "nest" in which one feels at peace. (Olenchak, 2009, p. 66)

The Personal Niche phase of the Bull's Eye Model of Affective Development centers on an individual's desire for belonging and independence. As messages are delivered via an individual's world context, affect is refined through the development of more advanced schemas, or Meta-Affect (Olenchak, 2009). A Personal Niche is ultimately discovered when an individual is able to match his/her capabilities with the environment. 2e adults who were not identified in their early developmental years often find the construction of a Personal Niche to be daunting. Without the benefit of diagnosis, knowledge about the disorder, and access to treatment and intervention

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options, the 2e adult may flounder unsuccessfully between jobs, relationships, or educational ventures.

The meta-affective process of reconciling aspects of personal identity determined by nature with environmental fluctuations is exacerbated by typical developmental concerns. For example, using Erikson's perspective on psychosocial development (1950) consider particularly the difficulties inherent in the adolescent era in which all individuals are faced with the challenge of identity versus role confusion, the underpinnings for healthy self-identity as an adult. Now consider that 2e individuals not only must grapple with the challenges imposed by identity formation during adolescence, but also must somehow come to terms with their disabilities and talents as they work to simultaneously find a Personal Niche.

As newly diagnosed adults work toward finding a personal niche it is essential that treatment methods are fully researched and explored. Though it is not the "magic bullet," the use of medication in treating ADHD has proven to be effective. Although pharmacological treatment has been widely studied, adult research is less prominent due to the aforementioned lack of diagnosis and treatment for this age group. The neurobiological nature of the disorder lends itself to drug interventions, providing long awaited relief for adults who were not diagnosed as children.

The efficacy of Methylphenidate (MPH) was assessed through the analysis of six trials (10 drug-placebo comparisons) with a total of 140 MPH treated ADHD adults and 113 placebo-treated ADHD adults (Faraone, Spencer, Aleardi, Pagano, & Biederman, 2004). This study sought to estimate the effect size for MPH therapy in adults and assess if study design features impacted the estimate of efficacy for this medication. The pooled effect size across the studies was statistically significant at 0.9 ($z = 4.3, p < 0.001$) and fell into a range similar to those found in studies of children. Study design (publication bias) was not statistically significant with an effect size of 0.5 ($t_g = 0.2, p = 0.9$). Results indicated that larger effect sizes of MPH were related to physician ratings and use of higher dosages. The meta-analysis revealed that when doses were adjusted for weight so that potency equals that used in pediatric studies, MPH treatment was efficacious in adults. The analysis also found that higher doses resulted in larger effect sizes when compared to lower doses (1.3 vs. 0.7).

In addition to examining the benefits of medication, the development of coping strategies is an essential component to the treatment process. Forty-four clinically referred ADHD adults were compared with 34 healthy controls to distinguish coping strategies used by ADHD adults (Young, 2005). The ADHD participants had previously undergone both psychological and psychiatric evaluations, received an ADHD diagnosis, and if prescribed, were receiving pharmacological treatment (Young & Toone, 2000). Examination of independent sample means demonstrated that the ADHD subjects employed maladaptive coping strategies that were confrontational ($t = 3.89, df = 64.4, p < 0.001$), escape avoidant ($t = 2.71, df = 76, p < 0.001$) and engaged positive reappraisal ($t = 1.92, df = 76, p < 0.05$), while exhibiting less planned problem-solving strategies ($t = 4.86, df = 44.3, p < 0.001$).

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Positive reappraisal was significantly correlated with impulsivity, indicating that ADHD adults have an enhanced ability to recover from stressful situations. “Thus for people with ADHD, the way they interact is associated with their cognitive ability, which may mean they continually assess, re-assess, compensate and adapt. This adaptive aspect of the syndrome may be expressed as creative and entrepreneurial personality characteristics” (2005, p. 814). These abilities could allow for the individual to succeed in a way that 21st-century globalization demands.

In a qualitative study of a dozen college students with both intellectual giftedness and a learning disability (LD), researchers found that the acquisition and utilization of compensation strategies were vital to academic success (Reis, McGuire, & Neu, 2000). Subjects who were identified as having LD in elementary or secondary school expressed that their compensation strategies were not developed at these levels. Instead, subjects were provided with content remediation or the chance to complete homework during their K-12 education. All 12 subjects participated in a university program for students with LD, and all had expressed that this was their first exposure to a structured program that taught compensation and learning strategies. Participants indicated that involvement in this program played a key role in their success as college students. The university program also focused on participant strengths, guiding students to select areas of concentration that developed their gifts and did not excessively overtax their areas of impairment.

As twice exceptional adults work to nurture their gifts, the identification of positive facets of the disorder can provide guidance. In a sample of both ADHD ($n = 45$) and non-ADHD ($n = 45$), undergraduate students at the University of Memphis, TN completed assessments that evaluated creativity through the examination of convergent and divergent thinking (White & Shah, 2006). The ADHD group performed better than the non-ADHD group on the Unusual Uses Task (UUT; $F(1, 88) = 14.6$, $MSE = .784$, $\eta^2_p = .142$, $p < 0.001$). This finding indicates the need for creativity assessment, in particular divergent thinking abilities, among ADHD adults. Individuals who demonstrate above average abilities in this area could be better matched with career niches where ADHD creative potential is valued and cultivated.

In sum, then, for 2e individuals – particularly once they achieve developmental and chronological adulthood – to attain an affective state emblematic of the Bull’s Eye Model’s Personal Niche, interventions are essential. Extant literature provides guidance insofar as an array of possibilities from use of medication, to acquisition of compensatory strategies, to focusing on creativity that is often associated with some disabilities. However, there exists no definitive, foolproof pathway for 2e individuals to achieve Personal Niche even fleetingly. Still, by utilizing a counseling approach that charts this pathway using the Bull’s Eye Model as a tool for enhancing each 2e individual’s comprehension of the affective development process, it seems plausible that attaining a Personal Niche can be facilitated. Such a counseling approach would entail a good deal of teaching on the part of the interventionist and an equal effort on the part of the 2e individual in application of knowledge as well as

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in experimentation and deep cognitive-affective work during Meta-Affect. Keeping in mind that Personal Niche is conceived as being a state that is likely fluid, given changes in each individual's circumstances and the degree to which Meta-Affect is regularly exercised, the affective development process is nonetheless more visceral and conative than it is cognitive and serendipitous. Hence, a counseling-based intervention program as the pivot point for all interventions is necessitated for 2e individuals first to find a reasonably stable place in terms of affective development and thereafter to be able to improve their achievement in all other aspects of life.

CONCLUSION

The Bull's Eye Model of Affective Development (Olenchak, 2009) offers professionals a theoretical framework from which to examine and understand adults who are twice exceptional. The few research studies that examine twice exceptional adults present findings that validate an ADHD diagnosis also indicate higher rates of comorbid disorders, such as major depression and generalized anxiety, when compared with other high IQ adults. The current educational world context employs assessment practices that fail to provide adequate group comparisons for students who are gifted and have ADHD, often leading both types of exceptionalities to go undetected. Further research is needed to determine the best methods to identify 2e students as early as possible. Doing so would serve as a flag for educational and psychological professionals to initiate interventions using the Bull's Eye Model as a critical foundation for all other programs for arbitrating the gap between disabilities and talents.

In related fashion, enhancing parent advocacy programs and strengthening parent education programs can be accomplished by relying on the Bull's Eye Model as the central framework. First, the Bull's Eye can facilitate parents' comprehension of the critical role affective development plays in the overall formation of successful persons. Second, the Model can serve as the curricular backdrop for providing specific knowledge and skills to help young people come to terms with: (1) who they are naturally; (2) what and how their small and large worlds influence them in terms of life circumstances; and (3) the importance of, and the means for, spending time integrating thoughts and feelings in a meta-affective manner.

As 21st-century school districts employ Response to Intervention (RTI), a multi-tiered approach to the early identification and support of students with learning and behavior needs, the complex nature of the intersection of giftedness and talents with a wide array of learning and behavioral disabilities requires additional training for school-based as well as other professionals. In addition to scaffolding their understanding of the importance of affective development, such training should also focus on the adoption of more comprehensive assessment practices. The developmental safety net provided by schools needs to encompass the identification of 2e students, particularly for at-risk students who lack financial means or are

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from underrepresented populations. Such individuals are less likely to be presented with, and taught how to apply, proactive critical compensatory strategies. Those who do not receive a diagnosis until adulthood will be altogether deprived of the opportunity to master coping strategies in a structured supportive environment. As a result, the advanced meta-affective processes associated with giftedness can work in a detrimental fashion for 2e adults who then attribute their failures to their personal character. Access to diagnostic assessment and treatment can free a 2e adult and empower him or her to identify the attributes associated with ADHD that can positively impact the development of talents. The emphasis on self-emotionality embedded in the Bull's Eye Model can produce a larger proportion of the population capable of achieving a Personal Niche. The ability of 2e individuals to wed one's cognitive and affective strengths in order to find a position of personal fulfillment is positive not only for the individuals who flourish, but also for the larger society as well. With this freedom comes the release of shame, the adaptation of coping behaviors, and the ability to identify a fulfilling place of adjustment that facilitates the positive integration of belonging with independence.

To sell your soul is the easiest thing in the world. That's what everybody does every hour of his life. If I asked you to keep your soul, would you understand why that's much harder? – Ayn Rand, *The Fountainhead* (1943)

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SECTION IV

CONCLUSION

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16. HAS THE TERM “GIFTED” BECOME GIFTIG (POISONOUS) TO THE NURTURANCE OF GIFTED POTENTIAL?

The term “gifted” once had a widely accepted, if misleading meaning—high IQ. The chapters in this volume make it clear that the term “gifted” now has many meanings. As implied by the title, the term “giftig” means, in German, poisonous. Using the term “gifted” can cause more harm than good if all we mean by “gifted” is high IQ. Our world is being poisoned by high-IQ people running dictatorships (usually disguised as “democracies”), terrorist organizations (often disguised as religious groups), world-polluting companies (often disguised as firms “developing” natural resources), and junk-food companies (disguised as food companies that want to give consumers a “choice”).

So what are we to make of the term “gifted”? I think there are three main issues to discuss: first, with regard to what the term “gifted” means; second, with regard to how we can assess giftedness; and third, what does all this mean for our understanding of giftedness, whatever it is, in the 21st century?

WHAT DOES “GIFTED” MEAN?

Lewis Terman, the father of the giftedness field in the United States, operationalized giftedness solely in terms of scores on the Stanford-Binet Intelligence Test, which he created (along with Maud Merrill). The advantage of this precise operational definition is that it left nothing ambiguous or open to multiple interpretations. The disadvantage is that the operationalization is very “early 20th century,” harking back to an era in which the field just did not know much about what giftedness is or what gifted individuals potentially could do. At the time Terman lived in the early 20th century, thinking of giftedness merely in terms of IQ was perhaps forgivable. Today it’s not, although there are many schools that still think of giftedness as little more than high IQ.

In this book, *giftedness* can refer to IQ (largely a measure of analytical thinking), creativity, common sense or practical intelligence, wisdom, ethics, various kinds of specialized talents (e.g., music, art, athletics, chess), leadership, and much more. If one looks at the range of challenges facing society in the 21st century, the current multivariate concept of giftedness seems much more accurate, encompassing, and appealing than the earlier limited concept. And it also seems to have some value in

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recognizing that people are not good or bad at everything cognitive, as some might interpret a theory of general intelligence as implying.

In our own research, we have found people can be analytically brilliant but uncreative or lacking in common sense; or they can be creative but not superb in taking analytical tests or in applying their creative ideas to everyday life; or they can be high in common sense but neither analytically nor creatively highly skilled (Sternberg, 1977, 1985, 1997, 2003, 2010; Sternberg, Jarvin, & Grigorenko, 2011). Gardner (2011) has proposed related ideas. In other words, knowledge of people's skills in one area does not tell us much about knowledge of skills in another conceptually different area. What is certain is that high IQ alone will not get people through all the creative, practical, and ethical challenges they will face as the 21st century moves forward.

The risk, of course, is that one develops a complex conception of giftedness but then cannot measure anything in that conception, which tends to lead educators back to simple measures. So can any of these attributes be measured?

MEASUREMENT FOR IDENTIFICATION OF GIFTEDNESS

My colleagues and I have been eager to show that broader gifts not only can be characterized verbally but also measured. Because of my own background in college admissions—my first full-time job was as a special assistant to the dean of undergraduate admissions at Yale—I was particularly interested in whether we could create measures that would be usable at the college level. My interest was not only in how to help students with gifts, but also in how to help universities choose the kinds of gifted students who will make the world a better place in which to live (Sternberg, in press).

The Rainbow Project

A first project was done when I was a professor at Yale. It was called the Rainbow Project. In the Rainbow Project, data were collected at 15 schools across the United States, including 8 four-year undergraduate institutions, 5 community colleges, and 2 high schools (see Sternberg, 2010). The participants were 1,013 students predominantly in their first year as undergraduates or their final year of high school. The final number of participants included in these analyses was 793.

The measure of analytical skills was provided by the SAT (a widely used college-admissions test in the United States, measuring verbal and quantitative skills) plus multiple-choice analytical items my colleagues and I added measuring inference of meanings of words from context, number series completions, and figural matrix completions.

Creative skills were measured by multiple-choice items and by performance-based items. The multiple-choice items were of three kinds. In Novel Analogies, students were presented with verbal analogies preceded by counterfactual premises

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(e.g., money falls off trees). They had to solve the analogies as though the counterfactual premises were true. In Novel Number Systems, students were presented with rules for novel number operations, for example, “flox,” which involves numerical manipulations that differ as a function of whether the first of two operands was greater than, equal to, or less than the second. Participants had to use the novel number operations to solve presented math problems. In a Figure Series with Mapping, participants were first presented with a figural series that involves one or more transformations; they then had to apply the rule of the series to a new figure with a different appearance, and complete the new series. These measures were not typical of assessments of creativity and were included for relative quickness of participants’ responses and relative ease of scoring.

Creative skills also were measured using open-ended measures. In Captioning Cartoons, students were given a cartoon and had to provide a caption for it. Written Story Telling required students to write two very short stories from a selection among unusual titles, such as “The Octopus’s Sneakers.” Oral Story Telling required orally telling two stories based upon choices of picture collages.

Open-ended performance-based answers were rated by trained raters for novelty, quality, and task-appropriateness. Multiple judges were used for each task and satisfactory reliability was achieved.

Multiple-choice measures of practical skills were of three kinds. In Everyday Problems of Adolescents, students were presented with a set of everyday problems in the life of an adolescent and had to select the option that best solved each problem. In Practical Mathematics, students were presented with scenarios requiring the use of math in everyday life (e.g., buying tickets for a ballgame), and had to solve math problems based on the scenarios. In a Route Planning for Complex Routes, students were presented with a map of an area (e.g., an entertainment park) and had to answer questions about navigating effectively through the area depicted by the map.

Practical skills also were assessed using three situational-judgment inventories tapping different types of tacit knowledge. The general format of tacit-knowledge inventories has been described elsewhere (Sternberg et al., 2000), so only the content of the inventories used in this study are described here. School-Based Practical problems provided everyday university situations for which a solution was required. Job-Based Practical problems provided everyday business problems, such as being assigned to work with a coworker whom one cannot stand. One had to figure out what to do. In Practical Problems Presented as Movies, movies presented everyday situations that confront undergraduate students, such as asking for a letter of recommendation from a professor who showed, through nonverbal cues, that he did not recognize the student very well. Test-takers then had to rate various options for how well they would work in response to each situation.

Unlike the creativity performance tasks, in the practical performance tasks the participants were not given a choice of situations to rate. For each task, participants were told that there was no “right” answer, and that the options described in each situation represented variations on how different people approach different situations.

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Consider examples of the kinds of items one might find on the Rainbow Assessment. An example of a creative item might be to write a story using the title “3516” or “It’s Moving Backward.” Another example might show a collage of pictures in which people were engaged in a wide variety of activities helping other people. One would then orally tell a story that takes off from the collage. An example of a practical item might show a movie in which a student has just received a poor grade on a test. His roommate had a health crisis the night before, and he had been up all night helping his roommate. His professor handed him back the test paper, with a disappointed look on her face, and suggested to the student that he study harder next time. The movie then stopped. The student then had to describe how he would handle the situation. Or the student might receive a written problem describing a conflict with another individual with whom she was working on a group project. The project was getting mired down in the interpersonal conflict. The student had to indicate how she would resolve the situation to get the project done. No strict time limits were set for completing the tests, although the instructors were given rough guidelines of about 70 minutes per session. The time taken to complete the battery of tests ranged from two to four hours. Creativity in this (and the subsequent Kaleidoscope) Project was assessed on the basis of the novelty and quality of responses. Practicality was assessed on the basis of the feasibility of the products with respect to human and material resources.

Three meaningful factors were extracted from the data: practical performance tests, creative performance tests, and multiple-choice tests (including analytical, creative, and practical). In other words, multiple-choice tests, regardless of what they were supposed to measure, clustered together in a single factor. Thus, method variance proved to be very important.

In order to test the incremental validity provided by Rainbow measures above and beyond the SAT in predicting first-year college grade-point average (GPA), a series of analyses was conducted that included the items analyzed above in the analytical, creative, and practical assessments.

Our results doubled prediction of first-year college grades beyond that provided by SATs alone. Our tests increased prediction provided by SAT combined with high school GPA by 50%. In other words, using our measures of creative and practical as well as analytical skills substantially improved prediction of first-year college success. Our analytical measure added nothing to the SAT. The increase in prediction was due largely to our creative assessments, and to a lesser extent to our practical assessment.

We also examined ethnic-group differences. There are a number of ways one can test for group differences in these measures, each of which involves a test of the size of the effect of ethnic group. Two different measures were chosen: ω^2 – omega squared and Cohen’s D. There were two general findings. First, in terms of overall differences, the Rainbow tests appeared to reduce ethnic-group differences relative to traditional assessments of abilities like the SAT. Second, in terms of specific differences, it appears that the Latino students benefited the most from the reduction

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of group differences. The black students, too, seemed to show a reduction in difference from the white mean for most of the Rainbow tests, although a substantial difference appeared to be maintained with the practical performance measures.

As an example of these results, omega squared was computed comparing scores of whites and Asian-Americans versus scores of members of under-represented minority groups (African-Americans, Hispanic-Americans, and American Indians) for the SAT Verbal was .09 and for the SAT Math was .04. For our measures, the median value was .02.

Although the group differences are not perfectly reduced, these findings suggest that measures can be designed that reduce ethnic and racial group differences on standardized tests, particularly for historically disadvantaged groups like black and Latino students. These findings have important implications for reducing adverse impact in undergraduate admissions.

The Kaleidoscope Project

The Rainbow Project was essentially an experiment. The results were not used for any practical purpose. At Tufts University in Medford, Massachusetts, USA, my colleagues and I put into practice some of the ideas from the Rainbow Project. In collaboration with Dean of Admissions Lee Coffin, my colleagues and I instituted Project Kaleidoscope, which represented an implementation of the ideas of Rainbow, but went beyond that project to include in its assessment the construct of wisdom (for more details, see Sternberg, 2010). Kaleidoscope is still being used at Tufts although I am no longer there.

Lee Coffin and the Tufts Undergraduate Admissions Office placed on the undergraduate application for all of the over 15,000 students applying in a given year to Arts, Sciences, and Engineering at Tufts, questions designed to assess wisdom, analytical and practical intelligence, and creativity synthesized (WICS), which is the augmented form of the theory of successful intelligence (Sternberg, 2003).

The questions were optional. No one had to answer them. Whereas the Rainbow Project was done as a separate high-stakes test administered with a proctor, the Kaleidoscope Project was done as part of the application process at Tufts. It just was not practical to administer a separate high-stakes test such as the Rainbow assessment for admission to one university. Moreover, the advantage Kaleidoscope was that it got us away from the high-stakes testing situation in which students must answer complex questions in very short amounts of time under incredible pressure.

Students were encouraged to answer just a single question so as to not overly burden them. Tufts University competes for applications with many other universities, and if Tufts' application were substantially more burdensome than those of our competitor schools, it would put Tufts at a real-world disadvantage in attracting applicants. In the theory of successful intelligence, successful intelligent individuals capitalize on strengths and compensate for or correct weaknesses. Our format gave students a chance to capitalize on a strength.

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Creativity and practicality were assessed in the same way as in the Rainbow Project. Analytical quality was assessed by the organization, logic, and balance of the essay. Wisdom was assessed by the extent to which the response represented the use of abilities and knowledge for a common good by balancing one's own, others', and institutional interests over the long and short terms through the infusion of positive ethical values. Here are examples of problems Kaleidoscope has used:

Analytical

1. The late scholar James P. O. Freedman referred to libraries as "essential harbors on the voyage toward understanding ourselves." What work of fiction or non-fiction would you include in a personal library? Why?
2. An American adage states that "curiosity killed the cat." If that is correct, why do we celebrate people like Galileo, Lincoln, and Gandhi, individuals who thought about longstanding problems in new ways or who defied conventional thinking to achieve great results?

Creative

3. History's great events often turn on small moments. For example, what if Rosa Parks had given up her seat on that Montgomery bus in 1955? What if Pope John Paul I had not died in 1978 after a month in office? What if Gore had beaten Bush in Florida and won the 2000 U.S. Presidential Election? Using your knowledge of American or world history, choose a defining moment and imagine an alternative historical scenario if that key event had played out differently.
4. Create a short story using one of the following topics:
 - a. The End of MTV
 - b. Confessions of a Middle School Bully
 - c. The Professor Disappeared
 - d. The Mysterious Lab
5. Using an 8.5x11 inch sheet of paper, create an ad for a movie, design a house, make an object better, illustrate an ad for an object.

Practical

6. Describe a moment in which you took a *risk* and achieved an unexpected goal. How did you persuade others to follow your lead? What lessons do you draw from this experience? You may reflect on examples from your academic, extracurricular or athletic experiences.

Wisdom

7. A high school curriculum does not always afford much intellectual freedom. Describe one of your unsatisfied intellectual passions. How might you apply this interest to serve the common good and make a difference in society?

Note that the goal was not to replace traditional admissions measurements like grade-point averages and class rank with some new test. Rather, it was to

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re-conceptualize applicants in terms of academic/analytical, creative, practical, and wisdom-based abilities, using the essays as one but not the only source of information. For example, highly creative work submitted in a portfolio also could be entered into the creativity rating, or evidence of creativity through winning of prizes or awards. The essays were major sources of information, but if other information was available, the trained admissions officers used it.

Applicants were evaluated for creative, practical, and wisdom-based skills, if sufficient evidence was available, as well as for academic (analytical) and personal qualities in general.

Among the applicants who were evaluated as being academically qualified for admission, approximately two-thirds completed an optional essay after the first year of the assessment. Merely doing the Kaleidoscope essays had no meaningful effect on chances of admissions. However, *quality* of essays or other evidence of creative, practical, or wisdom-based abilities did have an effect. For those rated as an “A” (top rating) by a trained admission officer in any of these three categories, average rates of acceptance were roughly double those for applicants not getting an A. Because of the large number of essays (over 8000 per year), only one rater rated applicants except for a sample to ensure that inter-rater reliability was sufficient, which it was.

Many measures do not look like conventional standardized tests, but have statistical properties that mimic them. My colleagues and I were therefore interested in convergent-discriminant validation of our measures. The correlation of our measures with a rated academic composite that included SAT scores and high school GPA were modest but significant for creative, practical thinking, and wise thinking. The correlations with a rating of quality of extracurricular participation and leadership were moderate for creative, practical, and wise thinking. Thus, the pattern of convergent-discriminant validation was what we had hoped for.

The average academic quality of applicants in Arts & Sciences rose in slightly in the first year of the pilot, in terms of both SAT and high school grade-point average. In addition, there were notably fewer students in what before had been the bottom third of the pool in terms of academic quality. Many of those students, seeing the new application, seem to have decided not to bother to apply. Many more strong applicants applied.

Thus, adopting these new methods did not result in less qualified applicants applying to the institution and being admitted. Rather, the applicants who were admitted were *more* qualified, but in a broader way. Perhaps most rewarding were the positive comments from large numbers of applicants that they felt the Kaleidoscope application gave them a chance to show themselves for who they are. Of course, many factors are involved in admissions decisions, and Kaleidoscope ratings were only one small part of the overall picture.

My colleagues and I did not get meaningful differences across ethnic groups, a result that surprised us, given that the earlier Rainbow Project reduced but did not eliminate differences. And after a number of years in which applications by underrepresented minorities were relatively flat in terms of numbers, this year

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they went up substantially. In the end, applications from African Americans and Hispanic-Americans increased significantly, and admissions of African-Americans were up 30% and of Hispanic-Americans up 15%.

We found, at the end of the first year, that students admitted with very high scores on Kaleidoscope did just as well academically as did students who were also excellent but who were admitted to Tufts for other reasons. But we also found that the students admitted with high Kaleidoscope scores excelled, on average, in participation in extracurricular and leadership activities.

So our results, like those of the Rainbow Project, showed that it is possible to increase academic quality and diversity simultaneously, and to do so for an entire undergraduate class at a major university, not just for small samples of students at some scattered schools. Most importantly, my colleagues and I sent a message to students, parents, high school guidance counselors, and others, that we believe that there is a more to a person than the narrow spectrum of skills assessed by standardized tests, and that these broader skills can be assessed in a quantifiable way.

WHAT DOES IT ALL MEAN FOR UNDERSTANDING GIFTEDNESS IN THE 21ST CENTURY?

As Ambrose (chapter 2, this volume) pointed out in the introductory chapter to this volume, the challenges facing the 21st century are substantially different from the challenges facing any previous century. Of course, people have said that in every century, but there is one unique feature to the current transition, namely, globalization. People today compete locally only on a small scale; for the most part, they now compete globally. There have been good effects of globalization, such as increased competitive pressures for excellent products and services at a reasonable cost. But the price of globalization is competitive pressure that has driven some people out of jobs and other people into lower paying jobs. On the whole, people at the top of the pecking order have seen their life conditions improve, while those at the bottom of the pecking order have seen their life conditions degenerate. The problem is that, as time has gone on, the top has become an increasingly small percentage. The United States is not alone among countries in seeing the middle class get squeezed out—that is, gravitate toward the lower end of the socioeconomic spectrum rather than toward the upper part.

What is worse, the opportunities being given to people to show where they belong in the spectrum of societal rewards are unequally, unfairly distributed. The gifted-education movement can help pressure educators and employers to use assessments for identifying the best talent that truly reflect what people can do in their schooling but, more important, in their jobs. The problem is that the measures being used in identification, for the most part, do a mediocre job of identifying the best students and, basically, a poor job of identifying the best employees. The best employees are not just the ones with the highest IQs. As the authors of this book recognize, gifts and talents go way beyond IQ and proxy measures, such as the SAT and the ACT in

HAS THE TERM “GIFTED” BECOME GIFTIG (POISONOUS) TO THE NURTURANCE

the United States. Even the A-levels in the UK measure school-based knowledge and skills, not the creative, practical, and wisdom-based and ethical skills people need to succeed in jobs.

In this final chapter, I have described some of the ways in which we have tried to identify those individuals who have the skills society needs most to thrive. Our measures are only a first pass. We would not claim they are refined or in any way finalized. But if civilization wants to move forward rather than backward, it needs to go beyond IQ to identify the people who will make the world a better place, not just for themselves, but for everyone. The term “giftedness,” in its original sense, has become giftig. But in the broader sense it is used in this volume, it points the way toward a much better world for all of us, not just some ill-chosen few.

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